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May 1996 • Number 27

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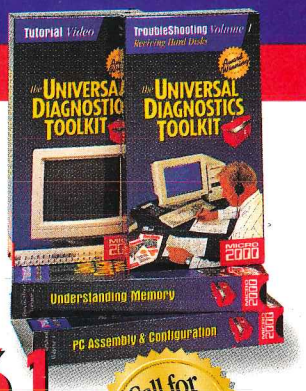

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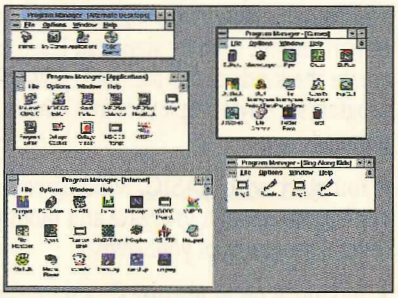
On the Cover

Pictured on the cover is the new MicroScan 17x, a 17-inch pivoting monitor from ADI Systems, San Jose, California. Cover photo by Larry Dunn.

FEATURES



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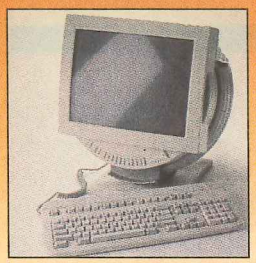

DOS WORLD

Number 27, May 1996

TIPS

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Letters to the Editor

In a Good Mode

Thank you for "Mining for DOS in Win95," by Robert L. Hummel ["Windows Seat," #24, November 1995, page 57]. I now boot to DOS, and when I want to run a Windows program, I can start Windows by typing WIN. I did get tired of typing MODE CO8Ø at the "OK to shut down computer" screen after exiting Windows to get my DOS prompt back, so I wrote a two-line batch file to start Windows:

```
WIN
MODE CO8Ø
```

I named this batch file W.BAT, but you can call it almost anything (not WIN.BAT, though, or it will cause a loop). Now when I exit Windows (by telling it to shut down the computer), I get back to the DOS prompt automatically.

John Meyer
Philadelphia, New York

Hurray for Super Mouse

I was wondering when someone was going to get around to finally printing a program like the QBasic mouse program in *DOS World* #25 ["Mousing Around in QBasic," by Hardin Brothers, January 1996, page 51].

MOUSDEMO.BAS should settle an argument that has been going on via America Online's message boards for quite some time. You also got a load of free advertising, because I posted a message telling everyone to check out this issue to find the long-awaited code.

Your magazine has provided numerous batch files and other items I've found useful in my programming. I can't wait to start modifying the code for my needs and getting mouse support into my QBasic programs. Keep up the good work.

Christopher Lee Boger
Internet

You may also use MOUSDEMO.BAS with Microsoft QuickBasic, with a slight adjustment. QuickBasic balks at the program's CALL ABSOLUTE statement; to get it running, start QuickBasic by typing:

```
QB /L
```

CALL ABSOLUTE isn't built into QuickBasic; you must link the library containing it to any program requiring that statement. Microsoft's Quick Library (QB.QLB), supplied with QuickBasic, includes support for CALL ABSOLUTE. The /L switch is usually followed by the name of the Quick Library you want to load, but when you use it without an argument, it loads QB.QLB by default. Hence, these two commands are equivalent:

```
QB /L
QB /L QB.QLB
```

—Eds.

I'm Swamped!

Your magazine has a great impact, and since you ran the article in the November 1995 issue ["Shareware Exchange," page 22] about my Units 5.1 conversion program, I've received a number of inquiries from your readers. I like that, but I can't afford to send program disks to all of them. Please inform your readers that they can get a copy of the program from your very own BBS or elsewhere.

Lars Josefsson
Jarfalla, Sweden

You can download Units (UNITS.ZIP) from File Area 5 of the DOS World *BBS, 603-924-3181. See the instructions on page 72 of this issue.*

—Eds.

Love of My Life

I've spent considerable time on the programs in *DOS World*, and I've really enjoyed the material. The fact that you cover material from a different perspective from the online services is a real bonus.

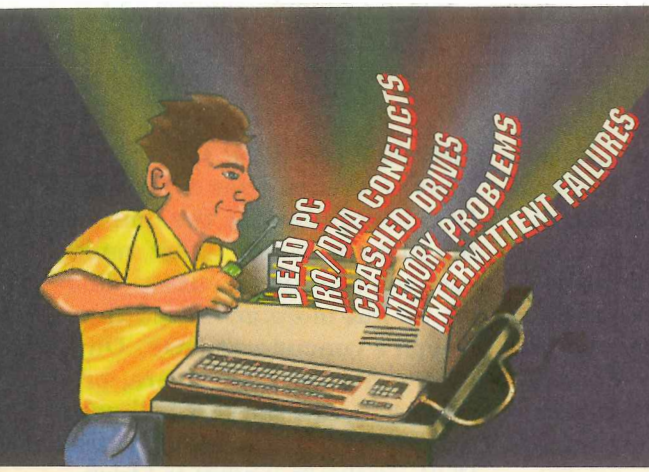
When I first saw *DOS World*, I knew this was a magazine I needed. It appeals to everyone, and the hell with Win95! Although I do enjoy Windows, DOS is the real love of my life.

Brian Rambo
DOS World *BBS*

OS/2 Outshines Win95

Not unlike many other computer magazines I read, you have, unfortunately, entered a Windows 95 phase. When I subscribed to your magazine, I admired it because you told me about lots of batch, Debug, and QBasic code. When I received your March 1996 issue [#26], I was disappointed to see all the references to articles covering Windows 95. I agree that a little about Win95 would be all right, but it isn't going to be new technology forever. I, for one, believe OS/2 is technically superior to Windows.

Windows 95 didn't start this drag-and-drop fad, or the Recycle Bin idea, or the notion of using a



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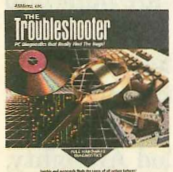

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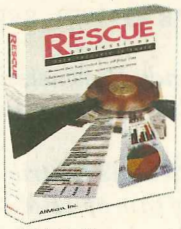

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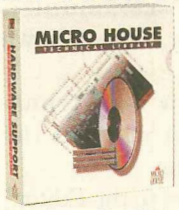

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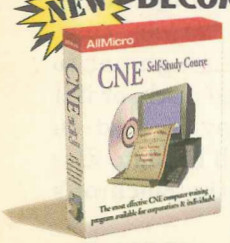

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DR

Contributors

for May 1996

Hardin Brothers *(pages 14, 23, and 51)* has been writing about computers for 15 years and serves as *DOS World*'s technical editor.

Kate Chase *(page 61)* is a free-lance computer journalist and on-line technical-support specialist.

Contributing Editor **Robert L. Hummel** *(pages 48 and 55)* is an engineer, consultant, and free-lance writer.

Contributing Editor **Ken Johnson** *(page 38)* is the training and support manager at the law firm of Mayer, Brown & Platt in Chicago.

Anne Fischer Lent and **Stan Miastkowski** *(page 26)* are the coauthors of numerous articles and books on computing, including *The Windows for Workgroups Bible* (Addison-Wesley, 1993).

Contributing Editor **Doug Lowe** *(page 44)* is the author of more than 20 books, including *Networking for Dummies* (IDG Books Worldwide).

Eric Maloney *(page 31)* is an editorial director of *DOS World* and *Maximize Windows*.

Beth Slick *(page 57)* is a best-selling computer journalist and the author of *BBSes for Dummies* and *Norton Utilities 8.0 for Dummies* (IDG Books Worldwide).

Steven F. Smith *(page 77)* is a senior editor at *DOS World* and *Maximize Windows*.

Taskbar. (OS/2's Window List was first.) OS/2 is probably the best multimedia platform available, and it runs some Windows programs better than Windows does. More than 5 million copies of Warp were sold in 1995. (Not everyone was willing to wait for Windows vaporware.) Yet I haven't seen a full-fledged article on Warp in your magazine.

In my opinion, Win95 isn't all it's glorified to be. If you want a powerful 32-bit operating system, get OS/2 Warp.

Andy Rossmeissl
Madison, Wisconsin

At least one of DOS World*'s contributors is also a big fan of IBM's OS/2; see "Warp Speed for DOS," by Stan Miastkowski, #22, July 1995, page 48, for details.*

Enough Net Bashing

Clifford Stoll [cited in "All Roads Lead to the Superhighway," *DOS World* #22 July 1995, page 4] is one of those unscrupulous authors trying to make a buck on negativism. I believe that the Internet represents the most exciting territory on the technological frontier.

Stoll is wrong in saying the impact will be negative. The Net will truly bring the people of the world together. We now have a chance at a global community, which, to survive as a species, we must create.

The Net will allow data transmission and contact without the stupidity of politicians.

Dan Gookin ["Letters to the Editor," page 6] needs to realize that individuals who contact a talk show with DOS questions generally don't know what they're doing.

DOS World subscribers are computer literates seeking to enhance their skills. Both areas need coverage. You need to include articles geared toward "DOS dummies" *and* "DOS pros."

Jean-Paul Tertocha
DOS World *BBS*

They Just Don't Get It

I have a dream. I see a day when DOS isn't judged by the limits of the past but by new 32-bit, multiuser, multitasking abilities—similar to, but more advanced than, Novell's concurrent DOS. Oh, I have a dream. DOS users, programmers, and hackers will unite to produce a user-supported free DOS, similar in concept to Linux—where source code is freely distributed, and where multiuser and multitasking abilities are built into its kernel.

I have a dream that someday DOS users will awake and say to Microsoft and IBM, "Free at last, free at last, thank God Almighty, we're free at last!" But alas, I awake to find my dream to be only a nightmare for Microsoft, one the company chooses to ignore. And IBM remains comatose, not knowing I've had a dream. It remains out of touch with its customers.

Marty Francom
Bremerton, Washington

Showing Its Age, Perhaps?

In the January 1996 issue of *DOS World* [#25, "Start-Up Clinic," by Jack Nimersheim, page 58], you answered this question from a reader: "When I turn on my other computer, it asks me to enter the date and time before displaying the system prompt . . . . Is there any way to prevent this from happening?" You told the reader to REM the DATE and TIME commands in his AUTOEXEC.BAT file; that made me reflect a bit on my own computing habits.

The reader apparently isn't paying close attention; the system date and time record are also shown, and he can change them if they're wrong or accept them by hitting the Enter key. His "other" computer may be old enough not to have a battery-backed clock, or if it does, the battery may be dead. In either event, won't all his data files from now on carry the machine's BIOS date?

I have an older machine that, on boot-up, always tells me the date is 01/01/80 and the time 00:00:00. I willingly adjust the entries because I depend on correct file dates to help me manage my data.

Richard Hillbert
Internet

ERRORS AND UPDATES

Discoveries by the Batch

The article by Frederick L. Sohn in the January 1996 issue ["Best of the Batch," #25, page 14] contains a typo. The second line of HLF.BAT should read:

```
IF "%1"=="" GOTO HELP
```

I have registered copies of PKZIP and PKUNZIP; line 7 with the /O switch is unrecognized, so I took it out and the program runs fine. Also, in adding files to HLP.ZIP (lines 26–29), don't use a filename that's the same as a directory name or the program will stop. I was running it in C:\ROOT.

Howard Rubin
Internet

No Longer in a Bad Mode

Although I appreciate your printing my letter in the March 1996 issue ["Broken Windows," page 4], I think you need to fix a rather onerous error in your reply. The command that's supposed to bring back the DOS screen when you tell Windows to shut down is MODE CO80. That's the one that failed to work on my father's computer.

My dad had previously come up with a much simpler method of keeping Win95 from starting at boot-up. Let Windows come up once and then get out of it; go to the directory containing WIN.COM. (Yes, as Robert Hummel points out, Win95 is just a program executed from the DOS command line.) Rename WIN.COM as something else. (My dad used LOSE.COM!) From then on, Windows won't come up unless you specifically execute the LOSE program. At boot-up you'll just get the "Bad command or file name" message.

Glenn Stumpff
Dayton, Ohio

The Freeware Connection

To obtain a copy of the freeware program EtherPPP, mentioned in "Make the Connection with DOS" (#26, March 1996, page 36), contact the *DOS World* BBS (603-924-3181; 8,N,1). The filename is ETHERPPP-.ZIP, located in File Area 5. The program is also available on CompuServe. Don't contact the developer, Merit Network; the firm doesn't supply the program to end users.

—Eds.

How to Contact The Editors

DOS World *welcomes letters, complaints, and submissions from readers. The easiest way to reach the editors is the U.S. mail:* DOS World, *86 Elm St., Peterborough, NH 03458. All letters to the editor and questions are understood to be submitted for publication unless otherwise indicated. You can also reach our staff electronically over CompuServe at* ***75300,2357*** *or the Internet at* ***75300.2357@compuserve.com****. Please include your complete address and a daytime phone number on your correspondence.*

In addition, you can reach the editors through the DW *bulletin-board system (****603-924-3181****). To connect, set your modem and software to 8 data bits, no parity, 1 stop bit.* DW*'s BBS lists all the QBasic and shareware programs mentioned in these pages. Shareware items listed on the* DW *BBS are products protected by copyright law. You're welcome to try these programs. If you find them useful, we ask you to register and pay the applicable fees to the programs' respective owners.*

DW *encourages the submission of DOS tips and batch-file articles from readers. Please submit all material on disk in ASCII format together with a double-spaced printed copy to our offices. The magazine cannot be responsible for the return of these manuscripts, unless an appropriate mailer and return postage are enclosed.*

DW *makes every effort to verify its articles and programs, but the magazine assumes no responsibility for any damages because of errors or omissions in our articles. Corrections to listings or articles are printed as soon as possible.*

DOS Tip

Margin of Safety

Looking for a way to protect a few files or directories from prying eyes? Don't overlook DOS's extended-character set. You can use some of these characters when naming one of your subdirectories, and then move your sensitive files into that subdirectory. Unless they're knowledgeable enough or determined enough to look them up, snoops will give up when they see the funny characters.

To insert an extended character while typing the name of a directory or file, hold down the Alt key while typing the character's three-digit code on the numeric keypad. Pressing Alt+205, for example, creates a symbol that looks like an equal sign but isn't the same character. Alt+255 produces a blank, but you can't duplicate it by pressing the spacebar. And, unlike the ASCII space character, Alt+255 is legal in filenames and directory names. You can even dress up your filenames with the Greek characters in the set.

Batch-File Brainteasers

Tips for Typing Text

In our September 1995 issue ("Brainteaser," page 41), we asked readers to come up with a batch file that displays several text files in sequence, pausing the display after each full screen of text. The challenge was to overcome a defect in DOS that prevents the use of the TYPE and MORE commands together in a FOR...IN...DO loop.

To briefly review the challenge, the two key lines in the original file, TYPEALL.BAT, looked like this:

```
@ECHO OFF
FOR %%A IN (report1.txt report2-
  .txt report3.txt) DO TYPE %%A
  | MORE
```

Alas, DOS ignores the instruction to pipe the display to MORE, which means that the three TXT files scroll by uninterrupted.

DOS World readers offered three creative solutions to add the pause after each screen.

The first, from Bob Fults (**bobfults@community.net**), uses the FOR...IN...DO statement as is, but precedes it with COMMAND /C. His two lines look like this:

```
@ECHO OFF
COMMAND /C FOR %%A IN (report1.txt
  report2.txt report3.txt) DO TYPE
  %%A | MORE
```

"A redirection symbol terminates the /C command argument and is applied to COMMAND.COM," explains Fults.

This is a good example of how to run a second DOS session to process a command. The routine is short and effective. Its drawback is that it displays a command-line prompt before typing each file, which makes for a somewhat cluttered screen.

The second solution, submitted by Michael Pryer of Toronto, Ontario, Canada, suggests calling a second batch file named READ.BAT, which handles reading each selected file. The main batch file looks like this:

```
@ECHO OFF
FOR %%A IN (report1.txt report2-
  .txt report3.txt) DO CALL READ
  %%A
```

READ.BAT looks like this:

```
@ECHO OFF
MORE < %1
```

Note that Pryer also uses a different technique for displaying each file. The command MORE < %1 is equivalent to the command TYPE %1 | MORE.

Pryer's solution is a good one but, of course, requires a support file, which works fine until you start passing your batch files along to other users. Support files tend to get lost, and you have to include explicit instructions on how to make sure that the second program is in a directory available to the first program.

Finally, Richard Penn of Montréal, Québec, Canada, suggests replacing the TYPE command with EDIT. His batch file looks like this:

```
@ECHO OFF
FOR %%A IN (report1.txt report2-
  .txt report3.txt) DO EDIT %%A
```

This is a neat trick if you want to be able to scroll and edit the files you're looking at. Its disadvantage is that you can't break out of the batch file once you start it—an inconvenience if you decide you don't want to look at the second and third files.

So how do these solutions from our readers stack up against the original? In case you missed it, here it is, trimmed a bit to make comparisons a little easier:

```
@ECHO OFF
IF "%1"=="NEXTFILE" GOTO NEXT
FOR %%A IN (report1.txt report2-
  .txt report3.txt) DO CALL %0
NEXTFILE %%A
GOTO END
:NEXT
TYPE %2 | MORE
:END
```

This batch file is similar to Pryer's, although the two might not look the same at first. The only real difference is that while Pryer's main batch file calls a second batch file named READ.BAT, which displays each file, this one calls itself and jumps to a subroutine called NEXT, which displays each file. In other words, Pryer's READ.BAT program is embedded in the main program as the subroutine NEXT.

The disadvantage of this technique is that the batch file is a little longer than the other solutions. On the other hand, it's self-contained, so you can pass it around without fear of losing support files.

To be really useful, all of the batch files above need to be changed so that you can enter a

filename at the command line. For example, the programs should let you type TYPEALL *.TXT to display all files with the extension TXT. The change basically requires replacing the IN set's three TXT files with the variable %1.

Next Case

In the world of DOS, there's always another solution to a batch-file problem, and there's always another batch-file problem in search of a solution. So let's throw out another brainteaser to test your batch-file skills.

The challenge: Rewrite Pryer's main batch file, which we'll name TYPEALL.BAT, so that it creates the second batch file, READ.BAT, on the fly. TYPEALL.BAT then calls READ.BAT as necessary and deletes it when done. To let TYPEALL.BAT accept a filename as a parameter, we'll also replace the the IN set's three text files with the variable %1. The logic will look something like this:

```
@ECHO OFF
::Code to generate READ.BAT goes
  here. READ.BAT consists of two
  lines:
::@ECHO OFF
::MORE < %1
FOR %%F IN (%1) DO CALL READ %%F
DEL READ.BAT
```

The rules are as follows:

- Your solution must produce a single, self-contained batch file called TYPEALL.BAT.
- TYPEALL.BAT must write, call, and delete a second batch file called READ.BAT. You can otherwise rewrite TYPEALL.BAT as much as you want.
- READ.BAT must include at least the two lines indicated in the prototype program listed above. ■

Send your solution to "Batch-File Brainteasers," DOS World, 86 Elm St., Peterborough, NH 03458. Include an explanation of how the batch file works, as well as a disk containing the program. Or e-mail your submission to our CompuServe address (75300,2357) or BBS (603-924-3181; 8,N,1).

Tips from Readers

The Name Game

I have a tip that might help beginning DOS batch programmers. When writing batch files, you need to keep in mind that DOS recognizes three types of executable programs: COM, EXE, and BAT files. When you issue a command to load a program, DOS looks first for a file of that name with the extension COM, then for one with an EXE extension, and finally for one with a BAT extension.

That means that you need to be careful when naming your batch files. If you assign a name already in use by a COM or EXE file and store your batch file in the same directory as the COM or EXE file, the operating system will never execute the batch file.

To understand why this is so, suppose that the directory C:\APPS contains files called SETUP.BAT and SETUP.EXE. If you type C:\APPS\SETUP at the DOS prompt, the operating system will look for SETUP.COM first. When it doesn't find it, it will look for SETUP.EXE. When it finds that file, it executes it. The result is that DOS never gets the chance to look for SETUP.BAT.

John Beaupain
Griffith, Indiana

Easy Does It

I developed the following short batch file, which I call BAKUP.BAT, to help coworkers back up their work files from the DOS prompt. I plan to use it myself to maintain copies of important system files, such as my INI, BAT, and SYS files.

BAKUP.BAT relies on the XCOPY command and its /S and /M switches. The program consists of two lines:

```
@ECHO OFF
FOR %%A IN (%1) DO XCOPY *.%%A/S/M A:
```

The /S switch tells DOS to copy all the specified files from the current directory and any subdirectories below it, duplicating the hard disk's directory structure on the floppy disk.

The /M switch tells DOS to set the archive bit of each file it copies so that the next time you back up your system, BAKUP will copy only new files or those whose contents have changed.

To use BAKUP.BAT to back up all the TXT files on your entire hard disk, place a copy of the batch file in your root directory; then type the file's name followed by the file extension TXT:

```
BAKUP TXT
```

If you run out of space on the floppy disk, insert a new one and type the above command again. Because the batch file uses the XCOPY command's /M switch, the batch file won't try to copy files it had already copied before the disk filled up.

John T.
CompuServe

Space-Saving Device

When they want to see a list of the files in a directory with the extension TXT, most DOS users type this command:

```
DIR *.TXT
```

But you don't need to go to all that trouble. You can skip both the space and the asterisk:

```
DIR.TXT
```

This trick works in all DOS versions, including Win95's DOS 7. You can even tack on switches, such as /P, and use this shortcut within batch files.

Bruce Engebretsen
Papua New Guinea

One for the Record Books

If you need to know the time but don't want to press the Enter key to accept it, use this DOS command instead of TIME:

```
ECHO|MORE|TIME|FIND "C"
```

DOS will respond by displaying a message in this format:

```
Current time is 12:38:27.03a
```

When you use this command:

```
ECHO|MORE|DATE|FIND "C"
```

you'll see the date instead:

```
Current date is Sat 01-14-1996
```

You may use these commands to create a batch file that tracks how long you work in a particular application or how long a program takes to execute. For example, if you want to track how much time you spend working in the program Clarion, you could write a program called CLARION.BAT:

```
@ECHO OFF
ECHO Starting Clarion>CLARION.LOG
ECHO|MORE|DATE|FIND "C">>CLARION.LOG
ECHO|MORE|TIME|FIND "C">>CLARION.LOG
```

Continued on page 13

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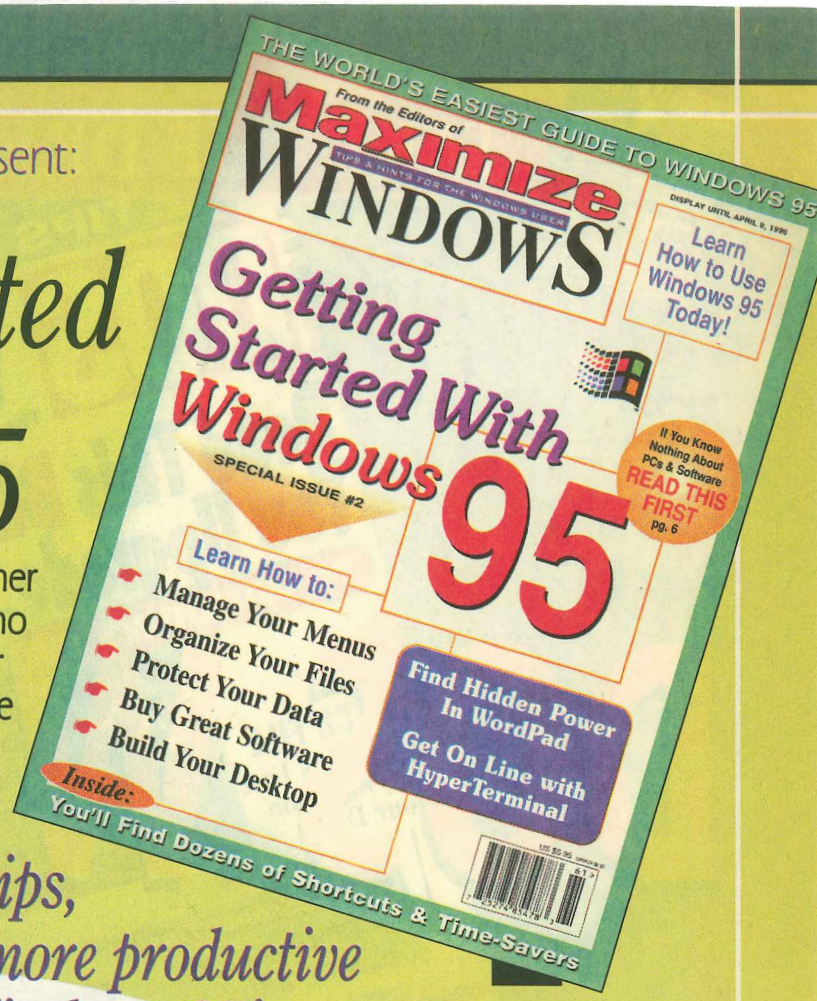

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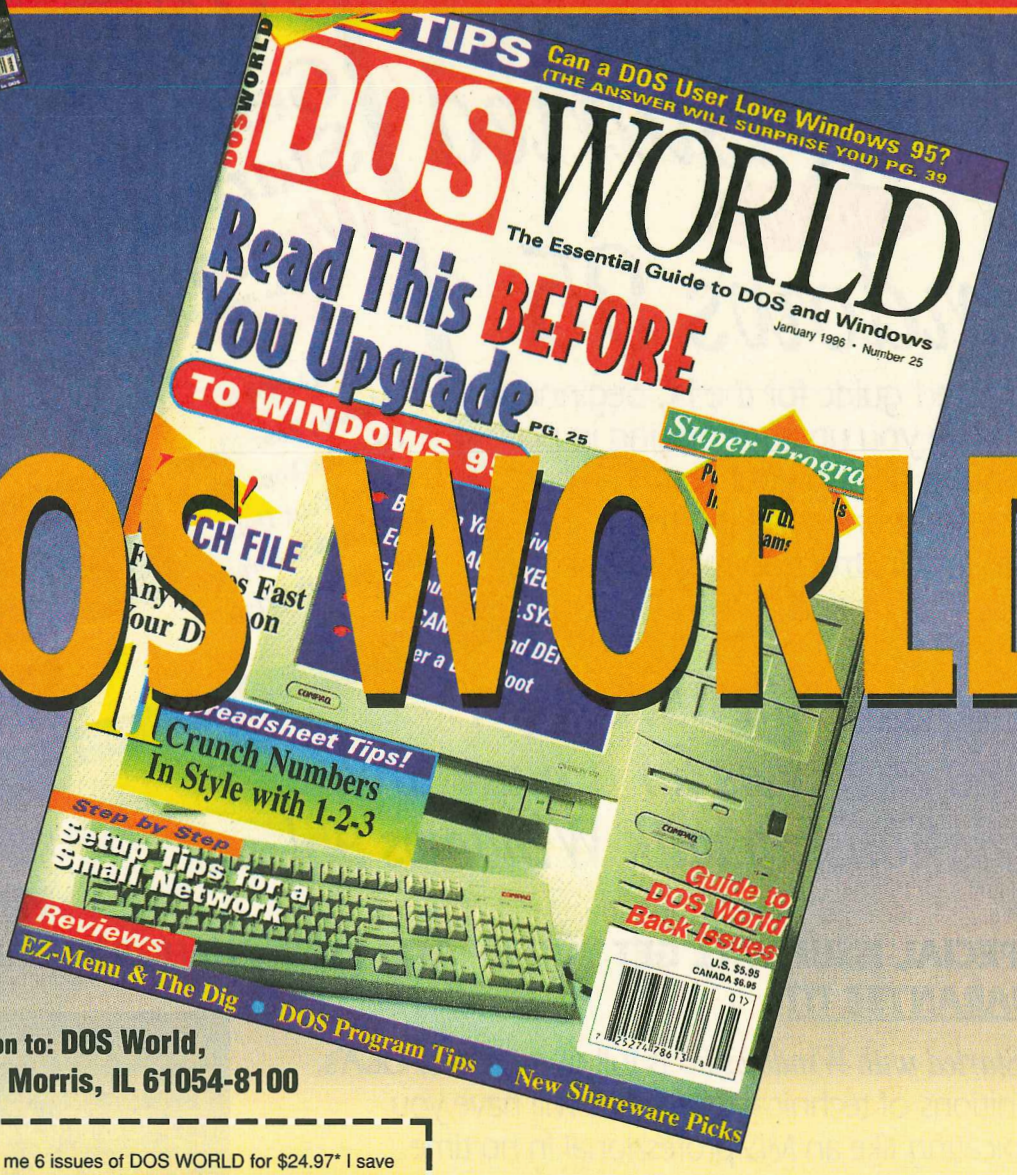

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```
CLARION
ECHO Ending Clarion>>CLARION.LOG
ECHO|MORE|DATE|FIND "C">>CLARION.LOG
ECHO|MORE|TIME|FIND "C">>CLARION.LOG
```

When you quit Clarion and look at CLARION.LOG, you'll see a display such as this one:

```
Starting Clarion
Current date is Sat 01-14-1996
Current time is 12:38:27.03a
Ending Clarion
Current date is Sat 01-14-1996
Current time is 18:00:27.03a
```

As written, CLARION.BAT starts a new log every time you run it. If you want to keep a running log over a series of days or weeks, change the single angle bracket in the second line to a double angle bracket. That tells DOS to append information to the existing file.

Gilles Probst
Manila, Philippines

Although Probst's commands for displaying the date and time work fine, there's a more economical way of accomplishing the same thing. To display the date, use this DOS command:

```
ECHO.|DATE|FIND "C"
```

The command for displaying the time is parallel:

```
ECHO.|TIME|FIND "C"
```

—Eds.

Unlocking Secrets

Ken Johnson's tip, "Controlling NUMLOCK" [*DOS World* #24, November 1995, page 35] mentions that you can't include a NUMLOCK command in a batch file or execute it at the DOS prompt. To use that command to turn your Num Lock key off or on at start-up, you have to place it in your AUTOEXEC.BAT file.

Unfortunately, this command is available only in DOS version 6.0 and later. Luckily, though, users with older DOS versions can use QBasic to achieve the same end, with a little juggling.

To turn off the Num Lock key at start-up, first create the following QBasic program called NUMOFF.BAS:

```
DEF SEG=0
BITS%=PEEK(&H417)
POKE &H417, (BITS% AND &HDF)
SYSTEM
```

Then add this line near the end of your AUTOEXEC.BAT file:

```
QBASIC /RUN NUMOFF
```

If you'd like to turn on Num Lock instead, substitute OR &H20 in place of AND &HDF, and change the program's name to NUMLOK.BAS.

While you're at it, you can create programs that turn Caps Lock on and off. To create a program called CAPLOK.BAS that turns the Caps Lock key on, use OR &H40 in place of AND &HDF. To create a program called CAPOFF.BAS, use OR &HBF.

The nice thing about all these little programs is that they don't toggle the function. If your Num Lock key is off, running NUMOFF.BAS doesn't turn it on.

Bernie Seneway
CompuServe

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DOS Tip

Taking Swift Action

When you use the DEL command in DOS 5 or later to delete files, DOS doesn't wipe them out immediately; instead it marks them as inactive and opens up the space they previously occupied. Although that doesn't present a real problem, it does slow down file searches, because DOS checks inactive as well as active entries when looking for files. To keep file searches efficient, use this command to display a list of a directory's inactive files:

```
UNDELETE *.* /DOS /LIST
```

If you find numerous inactive files you know you'll never want to recover, you may remove all of them from the directory:

1. Create a temporary directory called UNDELTMP.
2. Use XCOPY to copy all the directory's active files to this directory. (XCOPY won't copy the inactive files.)
3. Working in the original directory, type:

```
DEL *.*
```

4. Use the RD command to remove the old directory.
5. Use the MD command to recreate the directory.
6. Use MOVE to copy files in the temporary directory to the recreated directory.

Reader Forum

by Hardin Brothers

The Case of the Unreliable Floppies

In "Special-Delivery DOS Utilities" [DOS World #25, January 1996, page 22], you said that to improve readability, you should always reformat floppy disks before using them. When I get backup disks out of our vault, some of them are unreadable. These are brand-name disks on which we store important backup data. How can we keep data safe on floppy disks? Can we recover data with DOS's ScanDisk or another utility? How can we determine whether a disk will fail in the future?

Robert de Vlam
Ouderkerk-Amstel, Netherlands

Whew! Is it the phases of the moon or the effects of global warming? Whatever's going on, it's causing a flood of letters here, with some very interesting questions.

In general, floppy disks aren't a safe long-term storage medium. In fact, if your data is vital to your business, you shouldn't store it on any kind of magnetic medium at all. Manufacturers say that data on disks should last an average of three or four years.

That's under ideal magnetic, atmospheric, and storage conditions. And it's also an average. Some data won't last that long; some data will last longer.

In my computing experience, data on 3.5-inch floppy disks is easier to recover after several years than data on 5.25-inch disks, but that's not a guarantee. If you really need long-term archival storage, I suggest that you invest in something that will last a good deal longer, such as writable CD-ROM technology. It won't be inexpensive, but your data should last 50 years or more, by which time more permanent storage technologies and media will undoubtedly be available.

Of course, you can take some precautions to help your floppy-based data last longer. Don't store your disks near any source of magnetism, including fluorescent lights (I'll bet there are some in your vault), power lines (even ones hidden in walls), phones, or audio and video equipment. And don't store disks where they can be ruined by contaminants such as dust, fingerprints, oil, water, or heat.

Store floppy disks on edge, not flat—particularly 5.25-inch and the older 8-inch disks in flexible sleeves—and don't cram them into a storage box. Crimping or compressing a floppy disk's sleeve ruins the disk, because it can't rotate freely. You can sometimes resuscitate such disks by carefully removing the crimp in the sleeve or by removing the disk from the ruined sleeve and inserting it into a new sleeve. (Don't get fingerprints on the disk itself.)

If you can't afford more-permanent storage technology, one way to protect valuable data is by making several copies on the highest-quality disks you can find and storing each set of copies in a separate location. If a disaster such as a fire or broken water pipe strikes, you'll ruin only one set.

Then institute a schedule for renewing your data regularly by copying it onto fresh disks and throwing out the old ones (after bulk-erasing them so that the data is completely obliterated from prying eyes). These precautions seem extreme for most home users. But they're vital if the loss of your archived data would place a major financial burden on your business.

I'd use ScanDisk, CHKDSK, or any similar utility only to repair a disk as a last resort. If the data is failing, the utility is just as likely to make recovery impossible. Instead, try recovering the data with a disk-sector utility that can read information from one disk and write it to a hard disk or another floppy disk. **Disk Editor**, part of Symantec's **Norton Utilities** (800-441-7234; $179) includes this ability and has helped me recover seemingly lost data on more than one occasion.

Testing the Waters

I enjoy the information DOS World *provides about batch files, but I seem to have missed two things. What service does an exclamation mark in an* IF *statement provide? What does the slash do in a* FOR...IN...DO *statement?*

Joshua Tibbit
Temple, Texas

In DOS batch files, IF statements can take three forms:

```
IF [NOT] EXIST filename command
IF [NOT] ERRORLEVEL command
IF [NOT] string1==string2 command
```

When you use an IF statement to test two strings, the batch file will fail, and DOS will issue an error message, if one of the strings doesn't exist at all. For example, IF %1==MENU .... tests whether the first command-line parameter is the string MENU.

If there's no command-line parameter, the test becomes IF ==MENU .... That command makes no sense to DOS, which then ends the batch file and displays an error message.

To avoid errors of this sort, batch programmers add an exclamation mark, another character, or a series of characters on both sides of the double-equal sign. That ensures that DOS has something to test.

In my previous example, most DOS batch-file programmers will employ a line such as one of the following:

```
IF !%1==!MENU ...
IF "%1"=="MENU" ...
IF ~%1==~MENU ...
```

A slash in a FOR...IN...DO statement separates the following word into two parts: the first letter and everything else. For example, this line:

```
FOR %%C IN (/DOS) DO ECHO %%C
```

produces these two lines:

```
D
OS
```

You can employ this undocumented use of the forward slash for everything from counted loops to breaking a filename into a drive, a subdirectory, a base filename, and an extension. Unfortunately, though, the forward slash doesn't work this way in the version of DOS supplied with Win95, and it may not work in all versions of PC-DOS, Novell DOS, and DR-DOS.

Variety Show

I have two questions. First, when I get a CD-ROM with a serial number, I write that number on the face of the CD with a permanent marker, so that I'll have the number even if I lose the documentation. I've been careful to write only around the inside ring, but a friend told me that I can safely write anywhere on the top of the disk. Is that true?

DOS Tip

Are You There?

When you're writing batch files in MS-DOS or PC-DOS, you can use the IF EXIST command to determine whether a file exists. That lets you ensure, for example, that a COPY command won't overwrite an existing file. But IF EXIST doesn't provide a direct way to check for the existence of a subdirectory name (so that you can, for example, check that a directory exists before copying files to it). This shortcoming isn't insurmountable, however, because a quirk in DOS's file system lets you make IF EXIST subdirectory-aware. The trick is to use a command such as the following:

```
IF EXIST path\NUL command
```

where *path* is the name of the subdirectory you're testing for and *command* is the action to be performed.

In DOS's file system, all devices, such as CON, LPT, and NUL, appear present in all subdirectories on all drives. Thus, if the path you provide is valid, DOS reports that the NUL "file" exists. If the path doesn't exist, DOS reports that the file doesn't exist, either.

—Robert L. Hummel

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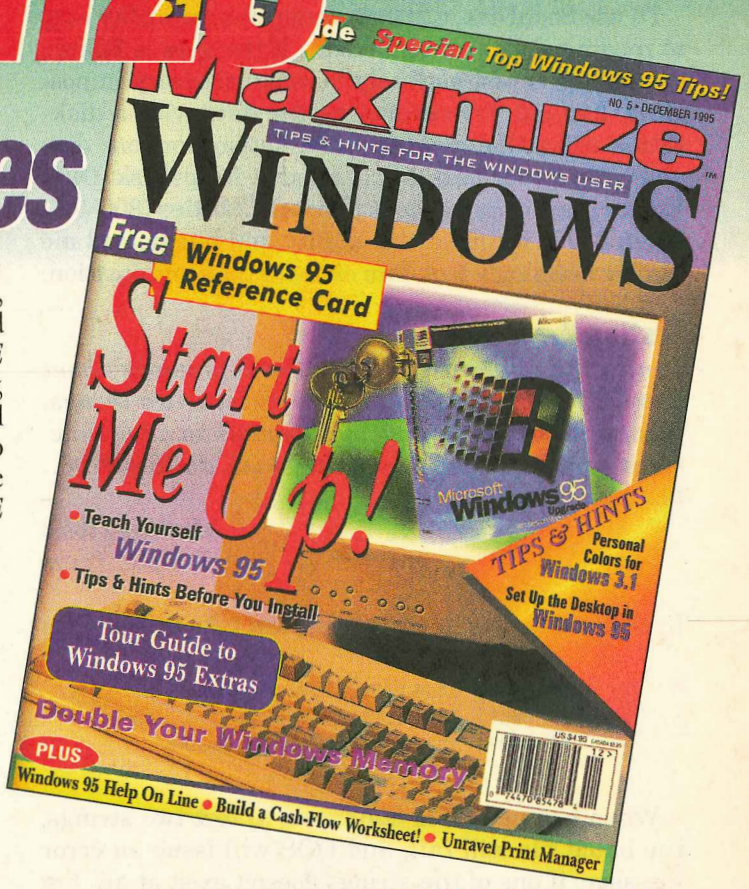

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Second, I'd like to select among various operating systems at bootup, including PC-DOS, Novell DOS, MS-DOS, various versions of Windows, OS/2, and Linux. Can I do that with a multiconfiguration CONFIG.SYS *menu?*

Roger Gledhill
Ann Arbor, Michigan

Whether it's a CD-ROM or a music CD, the only part of a compact disc containing recorded information is the "back" side, the side without the printing. CD-player and -reader heads are positioned on only one side of the disc. Therefore, you're free to write anything you want on the printed side.

I've seen some people stick tape on the printed side of a CD and write on that, which makes me cringe, but doesn't seem to do any harm in most players (unless the tape comes loose and drags against the inside of the CD reader).

There's a corollary to this that many people don't consider. If you don't put your audio CDs or CD-ROMs back into their cases after playing them, you should probably put them face down on your desk or table to avoid scratching or soiling the side containing recorded information. Most people place them face up, often taking a great deal of care to keep from getting fingerprints on the printed side. At least they have good intentions.

To answer your second question, it takes more than a multiconfiguration menu to boot your computer with the option of starting a variety of operating systems. The reason is that each operating system in your list (except for Windows 3.x) requires different boot files. In MS-DOS, they're usually called IO.SYS and MSDOS.SYS. The code in these bootup files opens and executes the instructions in CONFIG.SYS.

But that doesn't mean you can't run several operating systems on one computer. I have a computer with Windows 95, two earlier versions of MS-DOS and Windows 3.x, and OS/2. I need these operating systems to prepare and test products for my various clients. At boot time, I simply pick the one I want to run or let the computer boot up in the last configuration I used.

To get this flexibility, I use a commercial program: **System Commander** from V Communications ($99.95; 408-296-4224). With System Commander, you don't need to reconfigure your hard disk for most operating systems, nor do you have to worry about what the configuration files are called. System Commander recognizes most operating systems as you load them and handles all the details during each reboot.

The program is expensive, but it's invaluable if you need to run several operating systems on the same computer.

Everything in Its Place

In "Exorcising Demons," ["Reader Forum," DOS World *#25, January 1996, page 10] you say that the first three lines of* CONFIG.SYS *should be* DEVICE=HIMEM.SYS, DEVICE=EMM386.SYS, *and* DOS=HIGH,UMB, *in that order. I set up my* CONFIG.SYS *in that form and then ran MemMaker. It divided the third line and placed those two parts,* DOS=UMB *and* DOS=HIGH, *later in* CONFIG.SYS. *So who's right: you or MemMaker?*

Frank SanGregory
Tiffin, Ohio

I guess we're sometimes too dogmatic here at *DOS World*. I still think that the HIMEM and EMM386 lines should be first in most CONFIG.SYS files.

You can place the DOS= HIGH,UMB setting almost anywhere in your CONFIG.SYS file. When DOS reads CONFIG.SYS, it executes the DEVICE commands and some of the other commands in the order in which they appear. However, it doesn't execute other commands, such as the DOS command, in order. Instead, DOS scans your entire CONFIG.SYS file for those

DOS Tip

Formatting on the Double

If you'd like to quickly format a floppy disk without having to answer DOS's follow-up questions, use this syntax when you execute the FORMAT command:

```
FORMAT drive: /U /AUTOTEST
```

The /U switch tells DOS to format the floppy disk unconditionally. If you omit this switch, and the disk is already formatted, DOS takes the time to save unformat information and verify the format of the disk. The second switch, /AUTOTEST, tells DOS to format the disk but omit the inquiries that normally follow. /U is available in DOS 5 through DOS 6.22; it isn't available in the version of DOS that comes with Windows 95. /AUTOTEST is available in DOS 5 and later but is undocumented.

To reduce typing, I use a one-line batch file called FORM.BAT to handle formatting chores:

```
FORMAT %1 /U /AUTOTEST
```

Adding the %1 parameter lets me use this batch file to format the disk in any drive.

—Michael A. Rockwell

Got a burning question regarding DOS or Windows computing?

PERHAPS WE CAN HELP.

Send your problems and puzzlers to Reader Forum, DOS World, 86 Elm Street, Peterborough, NH 03458. Or drop us a line on CompuServe (75300,2357) or the Internet (75300.2357@compuserve.com). Unfortunately, owing to the volume of mail we receive, we can't guarantee a response to every question.

commands and sets its own internal flags to indicate how it should configure itself.

In my DOS-configuration seminars, I always urge users to place those three commands first, because they go together (unless you're using a third-party memory manager such as Quarterdeck Software's QEMM). But MemMaker follows its own internal logic as it fine-tunes your configuration files, often separating the DOS command into two lines and placing them later in CONFIG.SYS. Either technique produces the same final configuration, so either one is fine.

On the Upgrade

I own an 80286 IBM AT and wonder if you can suggest a way to get a CD-ROM drive without upgrading my motherboard. I know it would probably be some big, clunky, slow model, but anything is better than what I have now—nothing.

Dan Krueger
DOS World *BBS*

It depends on what you have in mind. If you want a CD-ROM for text-based applications, of course you can add one to your computer. A CD-ROM reader is simply another storage device—a little faster than most floppy disks and slower than most hard disks. Just look for a CD-ROM and adapter board that will work with your computer, or call a couple of the top producers of CD-ROM readers and ask which model they recommend. Of course, if there's a used-computer store in your area, perhaps you can find a real bargain in a single-speed CD-ROM reader.

If, however, you have visions of running multimedia programs, action games, and MIDI sound cards, you'd be better off upgrading to a new computer. Many such programs today depend on CPU power you simply don't have, graphics support your computer probably can't provide, and an operating system (Windows 3.1 or later) you probably don't use. There's nothing wrong with an older computer, except when you want to run the newest and hottest programs.

Where Has All the Memory Gone?

I have a 486 computer with 8MB of memory. Normally, I have 619K of conventional memory and 41K of upper memory left at start-up. When I omit the NOEMS switch in the EMM386.SYS command in my CONFIG.SYS file so that I can use extended memory to simulate expanded memory, everything (SMARTDRV.EXE, MSCDEX.EXE, and so on) loads into conventional memory, and I have only 498K of conventional memory left. Can I fix this, or do I have to use a boot disk when I want to run my computer with expanded memory?

Harold Miller
DOS World *BBS*

When you use expanded memory (EMS), you automatically give up a 64K chunk of upper memory: the space between the 640K point that marks the end of conventional memory and the end of the first megabyte of RAM in your computer. That 64K chunk is used as the swap space for EMS emulation.

After your computer sets this 64K *page frame* aside and makes allowances for your video card, a network card, a sound card, your BIOS, and so on, DOS may not have any space left in which to load anything high. But it's not likely. Instead, you probably forgot to add the switch RAM when you removed the NOEMS switch from the DEVICE=EMM386.SYS command. If you want to use upper memory, you must use either NOEMS or RAM (but not both). Otherwise, you won't have access to upper memory.

Try adding the switch RAM to your EMM386.SYS command and see whether that helps. Even if it doesn't, you don't have to resort to a boot disk to change your system's configuration, at least if you use DOS 6.0 or later. Look at the multiconfiguration section of DOS 6.x's

DOS Tip

Play It Again, DOSKEY

If you often find yourself creating batch files from a series of commands you just executed at the command line, think about loading DOSKEY at start-up. DOSKEY will sit in memory, recording your commands and storing them in its command-history buffer. To recall the commands and send them to a text file, you can use a command such as this one:

```
DOSKEY /H>C:\BATCH\DEL.BAT
```

If you need to do a little editing, simply call your new batch file into Edit or another text editor and make the necessary changes.

on-line help; it describes how to create a menu that lets you pick a configuration each time the computer boots up.

You should also look for information on using a question mark (in the section called "CONFIG.SYS Commands"). These techniques let you set up several configurations without resorting to a stack of boot disks. (To learn more about CONFIG.SYS and multiconfiguration menus, see "Put Your Best File Forward," page 38.)

Language Barrier

I write in French most of the time, so whenever I start my computer, my AUTOEXEC.BAT executes the line C:\DOS\KEYB CF,,C:\DOS\KEYBOARD.SYS. (CF stands for Canadian French*). This makes my keyboard bilingual. If I press Ctrl+Alt+F1, the keyboard switches to English. Ctrl+Alt+F2 changes it back to French.*

I'd like to activate the English keyboard when the computer boots. But I can't find the extended key code for Ctrl+Alt+F1 or for any other Ctrl+Alt combinations. Do they exist?

If not, how can I work around this problem? How do programs use those combinations?

Normand Laperle
Lévis, Québec
Canada

I have bad news; there aren't any extended key codes for Ctrl+Alt key combinations. When the PC keyboard and BIOS were first developed, no one thought about using combinations involving Ctrl, Alt, Scroll Lock, NumLock, Ins, and the two Shift keys.

Memory-resident (TSR) and application programs use these combinations by "cheating." The most common method is for a program to insert itself into the chain of commands that take effect when you press a key.

When DOS's KEYB.COM sees that you've pressed F1 or F2, it looks at the state of the shifted keys. If you're also holding down Ctrl and Alt, it springs into action. If you aren't, it lets the BIOS or another TSR handle the F1 or F2 key.

I don't know of a way to simulate these special keystrokes, and I don't have sufficient experience with KEYB.COM to suggest a work-around. Perhaps one of our readers has a method for switching keyboards without pressing Ctrl+Alt and a function key. ■

DOS Tip

Déjà Vu All Over Again

If you find yourself retyping the same or similar commands during a computing session, you could save yourself time by enlisting help from DOSKEY. Available in DOS 5 and later, this program offers several features, including intuitive command-line editing and the ability to maintain a command history and "play it back" for you.

To take advantage of these features, type DOSKEY at the DOS prompt or add the command to your AUTOEXEC.BAT file. To maintain a history of commands, use this basic syntax:

```
DOSKEY [/BUFSIZE=size]
```

where *size* tells DOS the number of bytes to dedicate to the command buffer—the storage area that keeps your command history. By default, 512 bytes are allocated for DOSKEY's use; the minimum buffer size is 256. The more space you allocate, the more memory DOSKEY consumes when you load it. By default, the program requires about 3K of memory.

The table below shows the keystrokes you may use to take advantage of DOSKEY's command-history features. To get a sense of how to use them, suppose that during a DOS cleanup session, you typed these two commands to see which files in your \WP directory have the extensions TMP and BAK:

```
DIR C:\WP\FEB\*.TMP
DIR C:\WP\FEB\*.BAK
```

After deciding that you wanted to delete all TMP files from \WP, you could display the first command again by pressing PgDn or the up-arrow key. To change DIR to DEL, use the editing features shown in the tip "Speedy Editorial Services," page 50.

DOSKEY's Command-History Keys

Keystroke	Action
PgUp	displays first command in DOSKEY's command-history buffer
PgDn	displays last command in DOSKEY's command-history buffer
up arrow	displays previous command
down arrow	displays next command
Alt+F7	clears command-history buffer
F7	displays numbered list of commands in command-history buffer
F8	searches for command most closely matching characters typed at command line
F9	asks for a line number (press F7 first to find out which one you need), then displays corresponding command

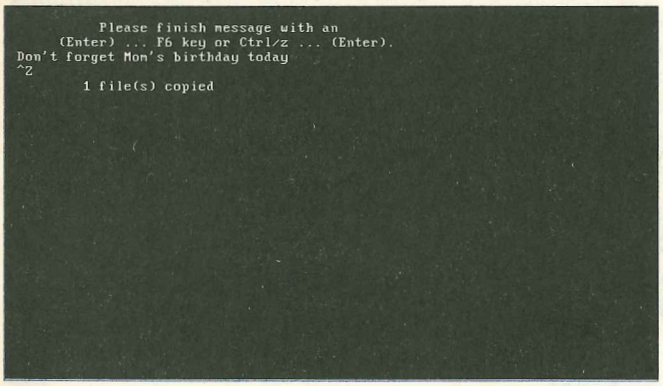
Best of the Batch

Display Notes Automatically

MINDER.BAT (see the listing, opposite) lets you store notes, then display them on a specified day when you turn your computer on. Say, for example, that you need to call Mom on August 1 to wish her a happy birthday. To store a mesage for later retrieval, you type the following command:

```
MINDER MESS 07-31-1996
```

The batch file opens a window with the COPY CON command. You type your message and press Ctrl+Z or the F6 key. (See the first screen shot, below.) DOS saves the message to a file containing the name of the date entered as a parameter. (In this example, it's 07-31-19; DOS ignores the 96 to make the filename eight characters.)



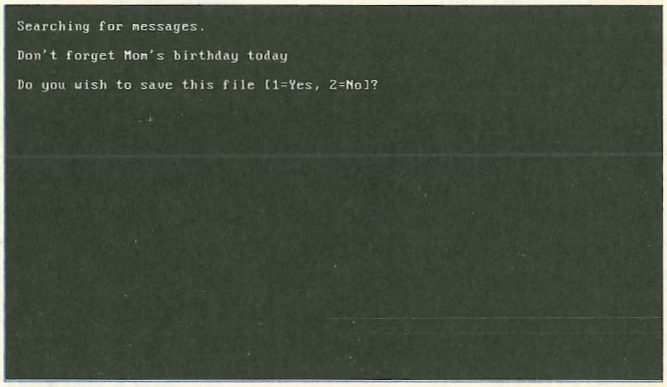
MINDER.BAT opens a window with COPY CON, lets you enter your message, and then saves it.

To get Minder to retrieve your messages automatically, add the following line to your AUTOEXEC.BAT file:

```
CALL MINDER RUN
```

Thereafter, your computer calls Minder each time you start your machine and displays any messages you've stored for that day. Thus, on July 31, your computer presents you with the screen in the second screen shot (top right).

You can store as many messages as you like for any given day. After Minder displays them, it gives you the option of saving or deleting the messages.



When you run it from AUTOEXEC.BAT, Minder looks for and displays messages for that day.

Note that to work properly, MINDER.BAT must be in a directory that's part of your path.

Minder's heart is its :RUN routine—the part of the batch file that runs when you type MINDER RUN. First, the DOS command DATE is echoed through the DOS command FIND and routed to a batch file called !.BAT. !.BAT consists of one line that looks something like this:

```
Current date is Wed 07-31-1996
```

Minder then creates the file CURRENT.BAT, consisting of this command:

```
SET DATE=%4
```

Do you have a batch file that's particularly interesting, unique, or useful? Do you have an alternative to one of the batch files you see here? Then why not share it with your fellow* DOS World *readers and get $50 to boot? Send your submission to "Best of the Batch," DOS World, 86 Elm St., Peterborough, NH 03458. Include a description of the batch file and how to use it, along with a disk containing the program. You can also send your batch file to our CompuServe address (75300,2357) or the* DOS World *BBS (603-924-3181; 8,N,1). However you send it, please include your address (postal and e-mail) and phone number on all submitted material and in the batch file.

MINDER.BAT lets you store notes, then display them automatically on a specified day.

```
@ECHO OFF
CLS
IF %1! == ! GOTO DOCS
GOTO %1

:MESS
IF %2! == ! GOTO DOCS
ECHO           PLEASE FINISH MESSAGE WITH AN
ECHO      (ENTER) ... F6 KEY OR CTRL/Z ... (ENTER).
COPY CON TMP
TYPE TMP >>%2
IF EXIST TMP DEL TMP
GOTO L8R

:RUN
ECHO SEARCHING FOR MESSAGES.
ECHO.
ECHO.|DATE |FIND/I "CURRENT" >!.BAT
ECHO SET DATE=%%4 >CURRENT.BAT
CALL !
IF NOT EXIST %DATE% ECHO            NO MESSAGES TODAY.
CHOICE /N/C:1/T:1,2>NUL
IF NOT EXIST %DATE% GOTO CLEANUP
IF EXIST %DATE% TYPE %DATE%
ECHO.
:: AS IS, MESSAGES WILL BE SAVED TO THE CURRENT DIRECTORY
:: AND CAN BE DELETED WHENEVER BY TYPING DEL ??-??*.
CHOICE /N/C:12 DO YOU WISH TO SAVE THIS FILE [1=YES, 2=NO]?
IF ERRORLEVEL 2 DEL %DATE%
GOTO CLEANUP

:DOCS
ECHO.
ECHO TO LOG A MESSAGE PLEASE ENTER:
ECHO    MINDER...MESS...THEN THE DATE YOU WANT THE MESSAGE SHOWN.
ECHO.
ECHO                        SAMPLE:
ECHO                 MINDER MESS MM-DD-YYYY
ECHO.
ECHO FOR DOS 6 AND ABOVE:
ECHO.
ECHO FOR AUTOMATIC SETUP:
ECHO     PLACE MINDER.BAT SOMEWHERE IN PATH, THEN ADD THE LINE
ECHO     "CALL MINDER RUN" TO YOUR AUTOEXEC.BAT. AT EVERY BOOT-UP
ECHO     MINDER WILL SEARCH FOR ANY MESSAGES SET FOR THAT DAY.
ECHO.
ECHO TO RUN MINDER FROM THE COMMAND LINE:
ECHO     ENTER MINDER RUN.
ECHO.
ECHO TO PURGE SAVED MESSAGES:
ECHO     ENTER DEL ??-??*.
GOTO L8R
:CLEANUP
FOR %%Q IN ( ! CURRENT ) DO DEL %%Q.BAT
SET DATE=
:L8R
```

End

Next, Minder calls !.BAT. When DOS sees the first word, *Current*, it looks for a program called CURRENT, finds the batch file CURRENT.BAT, and runs it, passing along the parameters *Date*, *is*, *Wed*, and *07-31-1996*. CURRENT.BAT then sets the value of the environment variable DATE equal to the fourth parameter (%4), which is the current date.

DOS returns to the main batch file, MINDER.BAT, and looks for a filename that's the same as the date in the variable DATE. If Minder can't find a matching filename, it displays a "No messages today" line. If it finds a match, it uses the DOS TYPE command to display the file.

Larry Nelson
Seattle, Washington

Capturing a DOS Text Screen

The following batch file comes to us from Norwegian reader Stian Jakobsen. Unfortunately, Mr. Jakobsen didn't include his address on the letter, but the batch file is too interesting to go unpublished. If you're out there, Stian, let us know where you are! —*Eds.*

SCREEN.BAT (listing on page 22) lets you capture a screen from the DOS prompt and review it at your convenience. The program is useful when, for example, you want to preserve the output from a DOS command or batch file for later reference. It's also handy if you've got a screenful of information you want to restore after running a program and returning to DOS. To capture the screen, type:

```
SCREEN S
```

To make the screen reappear, type:

```
SCREEN R
```

The program works by creating a Debug script and saving the screen

to a temporary file called SCREEN-.TMP. When the program restores the screen, it load the screen file into memory as a normal program file and then moves the contents to the screen memory.

Your program environment must contain a TEMP variable pointing to a TEMP directory on your hard drive. To see whether you have such a variable, type SET at the DOS prompt and look for a line like this:

```
TEMP=C:\TEMP
```

If your environment doesn't include a TEMP variable, first make sure you have a directory on your hard drive called TEMP. Then add the following line to your AUTOEXEC.BAT file:

```
SET TEMP=C:\TEMP
```

SCREEN.BAT captures the output of any DOS command for later recall. To type the arrow in the 19th line while in DOS's Edit program, press Ctrl+P, Esc.

```
@ECHO OFF
IF "%1"=="r" GOTO RESTORE
IF "%1"=="R" GOTO RESTORE
IF "%1"=="s" GOTO SAVE
IF "%1"=="S" GOTO SAVE
:SYNTAX
ECHO.
ECHO SCREEN R - RESTORE SCREEN.
ECHO        S - SAVE SCREEN.
GOTO END
:RESTORE
IF NOT EXIST %TEMP%\SCREEN.TMP
  GOTO NOFILE
ECHO N %TEMP%\SCREEN.TMP
  >RESTORE.SCR
ECHO L >>RESTORE.SCR
ECHO M CS:100 FA0 B800:0
  >>RESTORE.SCR
ECHO Q >>RESTORE.SCR
DEBUG <RESTORE.SCR >NUL
DEL RESTORE.SCR
DEL %TEMP%\SCREEN.TMP
ECHO ←[24;0H
GOTO END
:SAVE
ECHO N%TEMP%\SCREEN.TMP >SAVE.SCR
ECHO R BX >>SAVE.SCR
ECHO 0 >>SAVE.SCR
ECHO R CX >>SAVE.SCR
ECHO FA0 >>SAVE.SCR
ECHO W B800:0 >>SAVE.SCR
ECHO Q >>SAVE.SCR
DEBUG <SAVE.SCR >NUL
DEL SAVE.SCR
GOTO END

:NOFILE
ECHO.
ECHO COULD NOT FIND SCREEN.TMP

:END
ECHO.
```

End

The program doesn't work with a monochrome adapter, and it runs only in 80-by-25 text mode. If you have a monochrome adapter or use a different screen mode, you'll need to change the addresses and range in the accompanying batch file.

Stian Jakobsen
Norway

Shareware Exchange

by Hardin Brothers

I'm starting with something different for this issue. Instead of writing about a program you should try, I'm going to tell you about a type of program you should avoid. Almost every month, someone submits a program that reads your computer's CMOS memory and saves the information it finds there to a floppy. CMOS memory contains all of your computer's basic settings; you can usually adjust them by pressing a special key during boot-up, before the computer tries to load any version of DOS, Windows, OS/2, or any other operating system.

Don't trust your computer to a program that may not know how to access more than a tiny fraction of your CMOS memory.

The idea behind the program is that when your computer's battery dies, you've got your CMOS settings preserved on your floppy. Presumably, you can simply pop another battery into the computer, boot from the disk, and copy the information back into your CMOS RAM. In less than five minutes, your computer will be back to normal.

It's a great idea in theory. But in practice, it's not so easy. Take the CMOS-save program I received this month. It was written more than five years ago, and it saves the 64 bytes of CMOS defined and standardized in the original IBM AT. The problem is that many computers contain additional CMOS memory, ranging from 128 bytes to more than 8K.

Compounding the problem is the fact that there's no longer a standard method for accessing the CMOS memory. Nor are there reliable methods for determining how much CMOS RAM is installed in a given computer. Consequently, I distrust any program that claims to be able to read, save, and later rewrite my computer's CMOS.

On my old 80286 computer, I might trust such a program. But my newer computers offer all kinds of configuration options, stored in CMOS. I can just see what would happen if a program wrote an incorrect system password into CMOS or defined the computer as having no hard drives or floppy drives.

If you're smart, you'll keep a printout—not a disk copy—of the information in your CMOS. Either print your CMOS screens (accessible by pressing a special key combination during bootup or, on 80286 computers, by running a program supplied with the computer) or display each screen and write down the information. Either method is much more secure than trusting your computer to a program that may not know how to access more than a tiny fraction of your CMOS memory.

Enough sermonizing; on to this month's selection of nominees. The programs discussed here are available from the *DOS World* bulletin-board system (603-924-3181), as well as from most information services and local BBSes. (See the sidebar, "Share the Wealth," page 24, and the "*DOS World* BBS" section of "How to Use This Magazine," page 72, for details on accessing the bulletin board. Registration fees are listed in the "Product Information" box, page 25.)

Setting Colors

This month's most unusual program was submitted by Joel Wilf of Encino, California:

Color Commander *is for anyone with a VGA display who wants to go beyond the 16 colors offered by DOS text mode. Color Commander lets you change any DOS color by adding or subtracting red, green, or blue to your heart's content. The program lets you save your new palette of colors. You can use it to improve the look of your favorite DOS application, or you can just have fun playing with the colors.*

To understand Color Commander, you first need a little information about VGA boards. Early video adapters (CGA and EGA) contained hard-wired colors. For example, if you wanted to display blue, you used color number 1. But all that ended with VGA, which is a little more complex.

In VGA, a color number simply points to a palette register. If your VGA card can display 256K colors, it contains 256K palette registers. If a program asks your VGA card to display color 1, in either text or graphics mode, it displays whatever color register 1 defines. When you reset your computer, or when a program resets the VGA board, you set the first 16 palettes to match the colors that were hard-wired into EGA and CGA.

Color Commander works by letting you adjust each of the first 16 color-palette registers, the ones used in text mode. Each register can hold 64 values for red, 64 for green, and 64 for blue. By adjusting red, green, and blue values, you can define any color you want for registers zero through 15. That means that with Color Commander, you can change the colors for almost any DOS text-mode program.

Why would you do that? Perhaps you don't like an application's standard colors. You can use Color Commander to tone them down, or you can turn blue (color 1) into a quiet cream or bright white (color 15) into screaming chartreuse. Color Commander makes it easy. You pick the color number you want to change and then set its new value. You can save the results in a palette file (extension PAL), which you can reload with Color Commander or, in the program's registered version, in a COM file, which you can run from the DOS command line or a batch file.

Not all DOS text-mode programs will accept Color Commander's changes. Some reset the video system when they start and end, canceling any new palette you may want to use. But many programs are well behaved and will accept your colors. Using a program like Color Commander is often the easiest way to set colors for your DOS programs.

Almost a Shell

Frequent readers of this column know that I'm rarely thrilled with DOS shells. Several years ago, I adjusted to Symantec's Norton Commander and I've stayed with it ever since; other shells seem to me to add inconvenience instead of convenience.

But if you don't have a favorite shell program, you probably should find one. The DOS command line and an ample group of batch files can do most of what a shell can, but sometimes it's handy to use a shell to just review your file structure and move or delete files that have outlived their usefulness. So occasionally I'll include a shareware shell here for those who are still looking for one they can live with.

David Schnute of Hot Springs, South Dakota, submitted a shell-like program this month:

My favorite and most indispensable shareware program is Gordon Haff's ***Directory Freedom****. It's a fast, compact alternative to DOS shells, and it offers a wide range of features, including a scrollable screen for viewing files and directories; selective file and directory operations, such as copy, move, rename, and so on; a built-in file viewer and support for external programs such as List; extensive configuration control; and a complete system-information screen.*

Directory Freedom, known as Dirfree or DF for short, is just the opposite of some DOS shells I've tried. It's small (less than 32K), fast, and uncluttered. It's an older program—the latest version I've seen was released at the end of 1992—but it's still capable and quite easy to use.

About the only computing habit you have to change to use Dirfree is to type DF instead of DIR. Up pops a simple directory screen, which can show any colors you choose.

You can move a cursor bar with the arrow keys and mark or unmark files with the spacebar. Dirfree's most-used commands are shown on screen, but they're just the start of the program's power. Press the Ctrl or Alt key and the commands in the menu box change. Other commands and information are listed on Dirfree's help screen.

SHARE THE WEALTH

Our "Shareware Exchange" column invites you to send a copy of your favorite shareware program on disk, along with a description and an explanation of why you like it (no more than 500 words) to Shareware Editor, *DOS World*, 86 Elm Street, Peterborough, NH 03458. Tell us how we can obtain a copy of the program. We'll select a pick of the month for each issue and pay the contributor $50. Other contributors will receive a $10 finder's fee. Please don't send us shareware you've written yourself—we prefer recommendations from users, not authors.

Contact us on CompuServe at **75300,2357**; on the Internet at **75300.2357@compuserve.com**; or on the *DOS World* BBS at **603-924-3181**. All programs featured in "Shareware Exchange" are available by modem from the *DOS World* BBS (instructions on page 64). Color Commander (CCMDR11A.ZIP), Directory Freedom (DF460.ZIP), and A1 Utilities (A1UTILS.ZIP) are in File Area 5. In addition, most of the programs described in "Shareware Exchange" can be found on major on-line services and local BBSes.

—Eds.

Certainly you'll find more-powerful DOS-shell programs. But do you really need them? And editors, file viewers, and compression programs are only a keystroke away in Dirfree. You can act on single files or groups of files. You can use COMMAND.COM, 4DOS, or any other command processor you want.

I did run into two minor problems with Dirfree. The first is that because of its age, it doesn't know how to distinguish between a 486 and a Pentium on its system-information page; it reports that I have a 438MHz 486 computer (when I run it in a DOS session within Windows 95). The second difficulty is a bit more serious: Dirfree gets confused when I ask it to change from one directory to another on a drive created with SUBST.

Otherwise, it seems to work flawlessly. If you're looking for a DOS Shell, Directory Freedom deserves at least a trial period on your computer.

Patches for Batches

If you depend on batch files, you probably find the DOS batch language frustratingly weak. But with a good set of utilities, your batch programs can become more powerful and look a lot sharper. The last nomination this month comes from Gerry Mills of Blackwood, South Australia:

I think the collection ***A1 Utilities*** *is the best available for DOS. These programs are primarily intended for batch-file processing and menu creation, but they also include test programs for keyboard, mouse, and joystick operation.*

The one I like most is A1.COM, which can do everything I wish DOS could. It offers screen color, delays, video-mode switching, sound, cursor positioning, keyboard-buffer options, and more—all in one file. Most of the utilities let you use the mouse as well. In fact, MC.COM lets you designate up to ten mouse-sensitive areas on screen, using error levels to determine where you clicked the mouse. And HL.COM can create full-screen highlighted menus from a single command line (with automatic screen saver).

I found A1 Utilities powerful, but a little confusing because of the way the documentation is presented. All together, the set includes 27 COM files, which can do everything from presenting menus and drawing boxes to halting your computer until a specific date and time.

Because these programs are written in assembly language, they're small and fast. The longest, A1.COM, is about 21K bytes; most of the others are less than 10K. A1.COM is the "Swiss Army Knife" of the bunch, capable of dozens of actions depending on the command-line options you use. If you type `A1 /?`, it displays ten screens of help information. In fact, help material takes up more than half the file. Each of the other programs also displays help if you type the name followed by /?.

The biggest difficulty in using A1 Utilities is trying to understand how the programs work together. A MANUAL.EXE file contains the documentation, but it offers no print function. You can either do dozens of screen prints or register the package and receive a printable 56-page handbook.

Otherwise, A1 is a handy collection that can spiff up your batch files and make them seem like full-fledged applications. Several demo files included with the program will give you a feel for the power of these utilities.

And the Winner Is . . .

Starting with this column, I plan to pick one program as the best shareware offering of the month—a program you should have on your computer, no matter what other shareware and commercial programs you use. This month, "Shareware of the Month" laurels go to **Color Commander**. It doesn't just add color to a monochrome DOS screen; it also adjusts program colors in ways the original authors never dreamed. If you use Windows, you've almost certainly experimented with various color schemes until you found one (or more) that works best with your monitor. With Color Commander, you can do the same with DOS screens and text-mode applications. That's a pretty neat trick—one you owe it to yourself to try. ■

PRODUCT INFORMATION

A1 Utilities
Eric Rodda Software
34 Abbeville Terrace
Marion 5043
South Australia
$44 Australian
(about $33 U.S.)

Color Commander 1.1
Mike Laszko
Data Management Systems
Registrations Department
P.O. Box 2828
Fallbrook, CA 92088-2828
$15 plus $1.50 shipping

Directory Freedom 4.60
Gordon Haff
Bit Masons Consulting
3205 Windsor Ridge Drive
Westborough, MA 01581
508-898-3321
$25
various registration options available

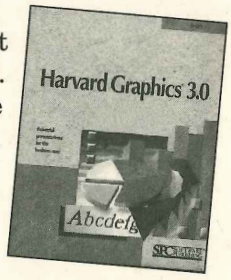
DOS Program Hints & Tips

by Anne Fischer Lent and Stan Miastkowski

Whether you're new to most popular DOS applications or an expert power user, chances are you're not using your software to its fullest. Every application has its tips, tricks, and shortcuts that can simplify your computing life and increase your productivity. But even experts don't always know all the time and effort savers. Here are 23 tips we've come across that'll make your DOS computing easier and more efficient.

TIP #1 Harvard Graphics for DOS: Button, Button, Who's Got the Button?

Use buttons in your Harvard Graphics 3.0 ScreenShow slides to personalize your presentations. Buttons let you go to specific charts and drawings, and even let you launch other presentation files. To create a button:



1. Go to Draw and display the chart or other object to contain the button.
2. Select the object you want to use as the button: the entire chart, a part of the chart you select after using the Ungroup tool, or a newly drawn object (perhaps a circle or a rectangle).
3. Select the Button tool and click your left mouse button in the button-name field. Type in a name, and click your right mouse button.
4. Click on F10—Continue. Save the chart by clicking on F6—File, then on Save Chart.

Now that you've learned how to create a button, you'll want to know how to assign it a function:

1. Be sure that you've added the file containing the button to your presentation.
2. Select Presentation from the Main menu, then Edit Presentation.
3. Select the file containing the button.
4. Select Edit Buttons from the HyperShow menu. (Press F9 to get that menu.) You'll see a pop-up with Button on one side and Go To on the other. You can assign the following actions to the button:

- **Next.** Displays next ScreenShow file.
- **Prev.** Displays previous ScreenShow file.
- **LastView.** Displays last chart shown on screen.
- **First.** Displays first file in presentation list.
- **Last.** Displays last file in presentation list.
- **Notes.** Displays notes pop-up for chart.
- **Chart.** Goes to chart data form.
- **Template.** Gets chart as template (without data for chart).
- **Nextpal.** Displays current chart with next palette in palette directory. (Works only when viewing SH3 file in Gallery.)
- **Prevpal.** Displays current chart with previous palette in palette directory. (Works only when viewing SH3 file in Gallery.)

5. Enter your choice of actions in the Go To column next to your button's name.
6. Click on F10—Continue, then F6—Main Menu/Presentation/Save Presentation to save it.
7. To view the finished presentation, select F6—Main Menu/Presentation/Display Screen Show. While in Screen Show, hit any key to move to the next slide (if necessary).

TIP #2 Harvard Graphics for DOS: Who's Hogging the Memory?

You may worry at times that your Harvard Graphics files are using all your memory. You can check to see

how much EMS or XMS memory the program is using by going to the Harvard Graphics directory in DOS (usually C:\HG3). Type HG3/M and press Enter. You'll see a Memory Usage Summary list showing you how much EMS and XMS are still available.

TIP #3 Harvard Graphics for DOS: Show Me My Values

If you're entering values into Harvard Graphics pie charts and they're not showing up when you tell the program to display them as percentages, do this:

1. Go to the Options menu (press F8 to get there) and select Slice Values.
2. Set Show Values to Yes.
3. Where the screen says "Trailing text," type a percent sign.
4. Press PgDn and set Show Percents to No.

TIP #4 Lotus Magellan for DOS: Index Those Floppies

Lotus Magellan is still one of the fastest ways to index and find information, no matter where it's located on your PC's hard disk. But did you know that Magellan can also index information you store on floppy disks?

To index a floppy, just display it in Magellan and press Alt+F5. Note that you won't be able to create a Magellan index on a floppy that's packed full with data. In general, figure you'll need about one-third of the floppy free to create an index.

Also, because Magellan temporarily uses extra disk space while creating an index, you may find it more efficient to create the floppy's index on your hard disk first, and then move it to the floppy.

TIP #5 Lotus Magellan for DOS: Marking Your Trail

One of Magellan's most useful features is Explore, which lets you browse information on your PC that meets the search criteria you enter. If your criteria are general, you may come up with many "hits"; as you browse through them, there's no need to try to remember which hits you want to save. While you're exploring, keep track of the files containing information that interests you by pressing the spacebar to mark the current file. Later, you can copy or move all those marked files to a new subdirectory or floppy disk.

TIP #6 Lotus Magellan for DOS: Quick Group Launch

Magellan is much more than just a file indexer; it also offers some clever advanced capabilities in file and application management. Say, for example, that you need to work on a series of files, one after another, using your word processor, spreadsheet, and so on. Magellan lets you mark a group of files and then use a macro to launch them separately. For instance, to edit each item in a group of marked files:

1. Sort the files in the List window so that all marked files are at the top.
2. With your cursor on the first file, press Alt+L to run the macro {IsMarked}{Launch}L{Home}{Alt+L}. This macro checks to see whether the current file is marked; if so, it executes the Launch command and automatically loads the file into the program Magellan has selected from the launch dialog box.
3. When you finish editing each file, quit the program and the macro will return you to Magellan.
4. In Magellan, move to the first marked file in the List window and repeat the procedure. The macro will stop when you've edited all marked files.

TIP #7 Norton Commander for DOS: Quick Sort

One of Norton Commander's biggest advantages is that you can see files at a glance. By default, the program sorts files by name, but there are certain times —especially in a directory with many entries—when you'd like to see your files sorted by different criteria. Norton Commander can also sort files by date, extension, and size.

Although you can change the sort criteria by the usual process of pressing F9, choosing Left (or Right), and scrolling down to the sort criteria you want to use, Commander also includes these shortcuts:

- **Ctrl+F5.** Sorts files by date.
- **Ctrl+F4.** Sorts files by extension.
- **Ctrl+F6.** Sorts files by size.
- **Ctrl+F3.** Returns to default sort by name.

TIP #8 Norton Commander for DOS: High Compression

All of us have files on our PCs that take up lots of space, yet we may want to keep them around for occasional use. Norton Commander lets you quickly compress and decompress files, even entire directories, with a couple of keystrokes, saving your valuable hard-disk space.

To compress a file or directory, point to it and press Alt+F5, enter the name under which you want to save it, and press Enter. By default, if you're compressing a directory, Commander also compresses all subdirec-

tories, but you can change that by clicking to remove the check from the box. You can also choose whether to delete the original files.

Commander uses its own built-in proprietary compression method, but it also lets you use other popular compression utilities by choosing the Select Method box. Commander can use PKZIP, ARJ, ARC, PAK, ZOO, and LHARC, but you'll need to have these utilities already installed on your PC; the program doesn't include them.

TIP #9 Quattro Pro for DOS: Flipping Pages

Quattro Pro's "Notebook" concept makes it easy to work with multiple spreadsheets, called "pages" in the notebook paradigm. For example, selecting more than one page in a Quattro Pro notebook is effortless. Hold down the Shift key and click on the tabs of the pages you want to include.

If you want to select the same range, say B3...F9, on several pages, select the block on the first page, hold down the Shift key, and click on the last page's tab.

TIP #10 Quattro Pro for DOS: Forging Links

You can easily link data among Quattro Pro Notebooks to save memory, reduce data duplication, or divide tasks among people in a workgroup.

Data links are simply formulas containing file references. The simplest type of link takes the form +[FILENAME]*block*. For example, +[MYFILE]A:B1 links cell B1 on page A of the Quattro Pro file MYFILE.WQ2 to the current worksheet. @SUM([MYFILE]A..A:A1..C7) sums the block A.. A:A1..C7 in MYFILE.WQ2.

TIP #11 Quicken for DOS: Get Me Out of Here

When it's time to exit Quicken, don't just shut off your computer; you'll lose Quicken's valuable indexing information. The program will be able to restart, but it will take some extra time rebuilding that data. Instead, take it nice and easy—one step at a time. Exiting correctly is as simple as pressing X from Quicken's main menu.

TIP #12 Quicken for DOS: I Never Repeat Myself

There are times when last year's financials will look very similar to this year's. When you want to keep all of last year's categories the same for this year, do this:

1. While in Register or Write/Print Checks, select the Activity menu, then Set Up Budgets. Open the Edit menu by pressing Alt+E, and then choose the Auto-Create All command.
2. Specify which months to copy in the Copy From and Through fields; for example, if you want to copy all of 1995, type 1/95 and 12/95 in the From and Through fields.
3. Tell Quicken where to paste the information by typing the month number in the Place Budget Starting in Month field.
4. Next, tell Quicken how to round the numbers. Press 1 if it shouldn't round, 2 to round to the nearest dollar, 3 to round to the nearest $10, and 4 to the nearest $100.
5. Click on Continue. When your budget is complete, choose F10—Save Budget and Exit.

TIP #13 Quicken for DOS: Searching for Files

If you don't know all the information about a transaction, you can still find it by telling Quicken something about it. In Register or Write/Print Checks, pull down the Edit menu and choose Find. You'll see the Transaction Find screen. Search the Payee, Memo, or Category field and use three special characters to focus your search:

- The **tilde** tells Quicken to exclude information. For example, tell it to find any transaction *not* containing the abbreviation *Dr.* in the payee category by simply typing ~Dr.
- **Two periods** find any transaction that includes that text. For example, to find transactions containing the name *John* in the payee field, type ..John..

DOS Tip — Watch Your Disk Swaps

Swapping floppy disks at the wrong time can be deadly to your data. For instance, suppose that you log onto drive A to copy a file. During the copy operation, you receive the error message "Error writing to drive A. Abort, Retry, Ignore?" Without pausing to consider the consequences, you remove the floppy disk from the drive, insert another one in its place, and press I to tell DOS to ignore the error. Although the copy procedure may then appear to go smoothly, when you try to read the second disk, you'll discover that its files are hopelessly scrambled.

Here's what went wrong. When you put the first disk into the drive and asked DOS to copy a file to it, DOS made a note of the information in the disk's file map, or file-allocation table (FAT). When you got the error message, you swapped disks and asked DOS to continue as though nothing were wrong. DOS copied the file and used the information about the first disk's FAT to update the FAT on the second disk.

The moral? Never change disks when you receive an "Abort, Retry, Ignore?" message. And, unless you're absolutely sure no harm will ensue, never tell DOS to ignore a disk error.

- The **question mark** represents one unknown character. For example, you might type DO? in the memo category to find all transactions involving DOS. You can include as many question marks as you like. For example, you could type D?? and Quicken would also find DOS.

TIP #14 Quicken for DOS: Back Me Up

If you're like most people, you know you should perform regular backups, but you don't always get around to it. If you perform Quicken backups even only once in a while, you're far better off than if you've never backed up your Quicken files through the year. If you never have, and your drive crashes, you have to enter all your transactions again. Imagine what a pain that would be!

There's an easier way. By telling Quicken to remind you to do regular backups, you can't blame your memory. Here's how:

1. Go to the Main menu and select File Activities.
2. Choose the Set Backup Frequency command. The Backup Reminder Frequency screen will pop up and you can choose to have Quicken remind you Never, Always (each time you edit the file), Weekly, or Monthly.
3. Then just press Enter and save your settings.

Note that when you run the Backup File command, you're backing up only your Quicken files. If other applications are important to you, and to retain your system settings, it's a better idea to do full system backups at least occasionally, followed by incremental backups at shorter intervals.

TIP #15 Paradox for DOS: Instant Miniscripts

PAL (Paradox Application Language) contains powerful commands not available from the main interface, but you don't need to go through the multistep process of creating, editing, and running a full-fledged PAL program to use them.

In Paradox 4.5, a *miniscript* is a one-line PAL statement; you type it in and Paradox executes it directly. To try this option, press Alt+F10 and choose MiniScript. Enter the PAL statement and press Enter.

TIP #16 Paradox for DOS: Invisible Windows

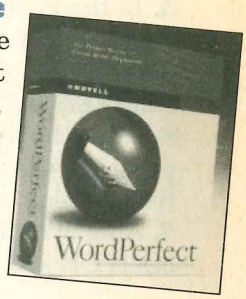
In Paradox 4.5, you can open a database table without showing it on screen. You'd normally use this option in a PAL program, so that you could read and update a table without making it visible (or accessible) to an end user. In addition, many operations in a "windowless table" run considerably faster than in a standard windowed table.

To create a windowless table, use the keyword NOWINDOW with the VIEW or COEDIT command, as in:

```
View NoWindow "Customer"
CoEdit NoWindow "Employee"
```

You can also use WINDOW CREATE to convert a windowless table to a standard windowed table. WINDOW DESTROY converts a standard windowed table to a windowless table.

TIP #17 WordPerfect for DOS: A Mode for Every Purpose



With WordPerfect 6.0, you get three ways to view and edit documents: text mode, graphics mode, and page mode. Switch among modes by pressing Alt+V to pull down the View menu and choose the one you need. Or use the button bar to switch between graphics and text modes. There's no button for page mode on the default button bar (WPMain), although you can use Button Bar Setup from the View menu to add one. So why three modes, anyway? Here's the scoop:

- **Text mode** is the best method for working with straight text because it displays all characters in the same monospaced font. It's also faster than graphics mode and page mode.
- **Graphics mode** imitates a WYSIWYG (what you see is what you get) environment and is the best view when you're formatting a document for printing, because it shows you text as it will appear in print. It also lets you size and move graphics with your mouse. For the best of both worlds, enter your material in text mode and switch to graphics mode to preview it before printing.
- **Page mode** is similar to graphics mode, but it's better for multipage documents because it shows the entire page, including headers, footers, and labels.

TIP #18 WordPerfect for DOS: DTP Finesse

WordPerfect 6 for DOS offers many desktop-publishing techniques that let you add that professional polish to your work.

You can easily flow your document into columns, for example, by selecting Layout/ Columns, or by pressing Alt+F7, C, which brings up WordPerfect's Text Columns dialog box.

Choose from Newspaper, Balanced Newspaper, Parallel, or Parallel with Block Protect. Then choose the number of columns (the default is 2) and press Enter. Adjust the distance between columns by selecting option 3 and entering the amount. Click on OK.

TIP #19 WordPerfect for DOS: Quick and Easy Fonts

With WordPerfect 6 for DOS, it's a snap to add new fonts. Just follow these simple steps:

1. Make sure that the font you want to install is on your hard drive and that you know the location.
2. Know what type of font it is (Bitstream, TrueType, and so forth).
3. Select Font/Font.../Setup.... From the Font Setup dialog box, select Install Fonts; then select the font type.
4. Specify the location of the font.
5. In the Font Selection windows, choose the font and then the Install Marked Fonts command. If necessary, press Enter in the Verify Location of Graphics Fonts Data Files dialog box.
6. After the font is installed, press Enter. Then keep pressing the Esc key until you return to the Font Setup dialog box.
7. After WordPerfect updates its fonts, press Enter or select OK and you'll see your new fonts in the font list.

TIP #20 WordPerfect for DOS: Running DOS Programs Directly

You don't have to close down what you're doing in WordPerfect 6 to run another DOS application. As long as your system contains enough memory, just select File; then choose Go to Shell. Next, select the DOS Command option. Enter the DOS command in the text field and press Enter.

If your system doesn't contain enough memory, you won't be able to run other DOS applications from the shell. You'll have to save your file, close down WordPerfect as you normally do, and run the DOS program all by itself.

TIP #21 XyWrite for DOS: Flip That Text

Here's a neat feature that makes for faster editing and type correction. XyWrite 4.0 lets you use keystroke combinations to transpose characters, words, sentences, or paragraphs. Press the tilde (~) key along with C (for characters), W (for word), S (for sentence), or P (for paragraph). Or press the tilde with 1, 2, 3, or 4 to transpose characters, words, sentences, or paragraphs, respectively.

TIP #22 XyWrite for DOS: Clipboardless Copying

Although you can use the familiar multistep process of pasting to and writing from a clipboard to move text around in XyWrite 4.0, there's a faster and simpler way, utilizing keystroke combinations:

1. Select the text you want to move by going to the first character, holding down Shift, and moving the cursor to the end of the block of text. Then release the Shift key. (You can also choose specific blocks of text by using the Select menu: F10, E, L.)
2. Move the cursor to the location to which you want to transfer the text.
3. Press Ctrl+C; the software copies your selected text to the new location. (Note that this procedure doesn't delete text from its previous location.)

TIP #23 XyWrite for DOS: Memo Pads

Ever feel as though you wanted to attach some kind of electronic "sticky note" to a file? In XyWrite 4.0, "memo pads" are places where you can record notes or information that are connected to a document file but are just for your own personal use. First, to create a memo-pad file:

1. Press F10. Select the Advanced Menu option, and then Memo Pad (F10, A, E).
2. Now choose Define (D) from the Memo Pad menu.
3. Press the Enter key and a Memo Pad dialog box appears.
4. Press the Enter key to open your memo pad; press Ctrl+ Shift+M to close it.

To use a memo pad you've created:

1. Press Ctrl+Shift+M to open the memo pad.
2. Enter your text.
3. Press Ctrl+Shift+M to close the memo pad. ■

DOS Tip Ask and Ye Shall Receive

Starting in DOS 6.2, the COPY, XCOPY, and MOVE commands ask for confirmation before overwriting an existing file—provided you issue the command while working at the DOS prompt. If you execute these commands in a batch file, they overwrite files without warning you first. Microsoft set things up this way to preserve compatibility with batch files written under earlier DOS versions.

If you want to receive confirmation both within batch files and when working at the DOS prompt, add the following command to your AUTOEXEC.BAT file, or type it at the command line:

```
SET COPYCMD=/-Y
```

To prevent COPY, XCOPY, and MOVE from ever asking for overwrite confirmation, use this command instead:

```
SET COPYCMD=/Y
```

Stretching the Limits of DOS

Microsoft can't tailor DOS to fit all our individual needs, so it's up to us users to customize our setups and turn MS-DOS into MY-DOS.

by Eric Maloney

For all its foibles, MS-DOS has one saving grace: pliancy. A huge contingent of professional and recreational programmers has addressed nearly every conceivable shortcoming, real and perceived. Think Microsoft forgot a command? You can bet someone's written one. Wish a command could do more than it does? With some digging, you'll probably find a replacement that meets your specifications.

Of course, with seven versions of DOS under its belt, Microsoft has answered many of its critics' complaints. The MOVE command is one example, preempting hundreds of file-move utilities and batch files that were written over the years. CHOICE, a command that (finally) permits keyboard input in batch files, is another. Even Windows 95's DOS 7 offers a few welcome tweaks, such as RENAME's new ability to rename directories.

Still, we all have different gripes, some of which will go unheeded. If Microsoft added every requested command and every conceivable switch, DOS would be an unmanageable nightmare, like a digital clock/timer/radio/calculator with only two buttons. Personally, I'm still grumbling about the MOVE command (for reasons I'll explain later), even though it seems to satisfy most users. On the other hand, while I'm perfectly happy with COPY and XCOPY, many other people aren't.

So it's up to us users to customize our setups—to find (or write) the DOS extenders that turn MS-DOS into MY-DOS. There's an ancient but functional MOVE utility out there that eases my pain, and there are dozens of shareware file-copy programs for those of you who don't like COPY.

What follows, then, isn't a comprehensive review of the world's greatest DOS utilities. It's a rundown of the 11 extenders I find most useful for my daily computing chores. I've used some for years. Others are recent: better replacements for old extenders or utilities with functions I can't do without. Each one meets these criteria:

- It's single-function (no all-in-one file managers or DOS shells).
- It's small. The biggest program among the 11 is 52K; combined, these utilities occupy about 265K.
- I use it all the time. I've got lots of nifty utilities that select, direct, dissect, inspect, correct, and reject (apologies to Arlo Guthrie), but they have specific functions I require only occasionally. I rely on the extenders described here for daily file-management tasks.
- It's easy to use. I have no patience with wacky syntax, complex switches, or idiosyncratic interfaces.

Extend That DOS!

If you've got a line on a DOS extender or two, let us know. Send us a copy of the program on disk, along with a brief summary of its strengths and weaknesses. Mail your suggestions to "Extend That DOS," 86 Elm St., Peterborough, NH 03458, or upload them to CompuServe **75300,2357**. If you're on the Internet, you can reach us at **75300.2357@compuserve.com**.

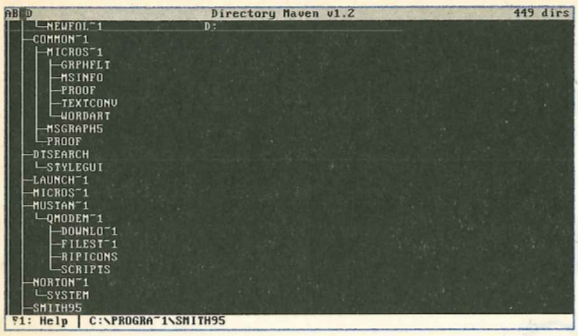


Figure 1. Directory Maven's tree mode lets easily move up and down directory paths.

In addition to these extenders, I use several DOSKEY macros that, in effect, extend the extenders. For example, I have a macro called FEDIT that uses an option in a file finder called GFF to locate a file and load it into DOS's text editor, Edit. It's the perfect command for quickly editing a text file that's six levels down another directory path. I've listed these macros in the accompanying sidebar, "I Did It MY-DOS" (opposite; apologies to Frank Sinatra).

As you read this list, you'll probably stop once in a while and say to yourself, "Hey! I've got a utility that's better than this one." We'd like to hear about it. We're always looking for interesting and useful products that help DOS users become more productive and efficient. On the other hand, if one of these utilities looks like something you'd like to try, all but one are available on the *DOS World* BBS. (See page 72 for dialing instructions.) The "Product Information" box (page 36) contains details on each program.

Switch Directories Fast!

One of the most ubiquitous type of DOS utility (and among the most popular batch-file projects) is the quick directory changer: Type a portion of a directory's name, and the program takes you there. Testing every directory changer ever written would be a task of Sisyphean proportions; you'd have a better shot at putting together a complete collection of Harlequin romances. So the idea is to find a directory changer that's efficient and bug-free and stick with it.

My directory changer of choice (at least, for right now) is the copyrighted freeware program **Directory Maven 1.2** (DM). It's a program I dug up fairly recently, after the directory changer I'd used for several years revealed a serious flaw: It couldn't find subdirectories more than three levels down. That's fatal when you're running Win95, whose directories sometimes plunge deeper than the Marianas Trench.

DM works pretty much like every other directory changer. To jump to a directory, you type:

```
DM [dirname]
```

For example, to go to the directory C:\123FILES\BUSPLANS\1996\AUGUST, you type:

```
DM AUGUST
```

DM also accepts wildcards and partial filenames. Either of the following gets you to the same place:

```
DM AUG
DM *GUS
```

If more than one directory matches your file specification, DM conveniently presents you with a selection menu.

DM also includes Tree Mode, which lets you scroll among your directories (**Figure 1**).

This program's main advantage is speed; it'll take you to any directory faster than you can say CHDIR (although, now that I think about it, CHDIR isn't all that easy to pronounce). But there's a trade-off. (Isn't there always?) DM gets its speed by building a data file containing a list of your directory paths. That means that when you create, delete, or move a directory, DM's database is obsolete. DM includes a switch that lets you add a directory to the data file, and it also lets you rebuild the data file, but neither solution is the most convenient.

If DM's use of a data file bothers you, find a directory changer that searches your drive whenever you run it. But, of course, each search will take much more time. I'm willing to choose speed over flexibility and rebuild the database as needed.

Finally, DM doesn't recognize long filenames. But then, why would you want to type:

```
DM Last Year's Expense Reports
for My Trip to Duluth
```

when the command DM DULUTH does the same job?

A Better Directory Changer

Most DOS users have become inured to the tedium of typing CD followed by long, finger-twisting filenames (except for those who use DOS 7 under Windows 95, for whom aliases filled with weird characters are likely to result in a sort of command-line Waterloo). Typos are a constant threat, and seldom-used directory paths six or seven levels deep are almost impossible to remember.

C2DD 1.0 makes directory changes almost pleasurable. (Okay, let's just say *tolerable*.) Its best feature is a pop-up history of your last 23 drive changes (**Figure 2**). Type C2DD /S, highlight the directory to which you want to switch, press Enter, and you're there.

Also, C2DD lets you include a drive letter with the pathname, something DOS's CD command prohibits. For example, to change from drive C to the subdirectory DOCS\REPORTS on drive D, you type:

```
C2DD D:\DOCS\REPORTS
```

And finally, C2DD includes a switch that lets you jump back and

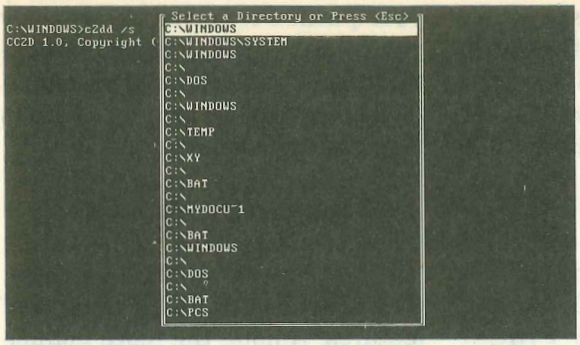


Figure 2. C2DD, a replacement for DOS's CD command, maintains a history of your last 23 directory changes and lets you choose the one to which one you want to jump.

forth between two directories. Let's say, for example, that you're in a directory called C:\UTILS\DISK\DIAG and change to C:\CSERVE\DOWNLOAD. To get back to \DIAG, type:

```
C2DD /B
```

These features are fine for everyday directory changing, but C2DD has a topping for the brownie: It lets you use another program as the directory changer. The advantage is subtle but important. If you use a navigator such as DM (see above) or The Norton Utilities' NCD to change directories, you can use a partial directory name and still log the directory into your C2DD history. For example, the following command:

```
C2DD /C:DM DIAG
```

changes you to the subdirectory C:\UTILS\DISK\DIAG. Now pop up C2DD's history, and you'll see that the directory shows up in the selection list.

It's a simple matter to define a DOSKEY macro that automates the procedure. For example, the following macro:

```
DOSKEY GO=C2DD /C:DM $*
```

lets me use the command GO DIAG to change to the subdirectory C:\UTILS\DISK\DIAG.

C2DD has some interesting uses as a batch-file command. For example, the program's documentation suggests a way to change to another directory, run a program, and change to the original directory when the program ends.

The best way to use C2DD is to define a DOSKEY macro that substitutes it for CD:

```
DOSKEY CD=C2DD
```

Thereafter, use the CD command as you always do.

If you give C2DD a try, you should be aware of one minor, undocumented flaw. When you use periods to move up a directory level, you need to add a space after the command, like so:

```
C2DD ..
```

Although you can change directories using this command:

```
C2DD..
```

it doesn't register the directory change in C2DD's history.

There's just one more thing: C2DD comes with an admirable documentation file that explains clearly the product's features and how to use them.

I DID IT MY-DOS

Integrating extenders seamlessly into your DOS will probably take a bit of tweaking. In my case, I gave a few of the utilities more-logical names. (For example, I changed UPCT's name to Timer.) In addition, I wrote DOKEY macros to make some of the programs easier to use. For example, the macro FEDIT is much easier to type than the lengthy GFF command it replaces.

I also used DOSKEY to combine commands, in essence creating new commands. The main function of GO, for example, is to jump to a specified directory, but it also logs the directory into C2DD's selection list. (See the main article for details.)

Following is a list of my renamed commands and DOSKEY macros. See the main article for more information on the commands' parameters and functions. **—E.M.**

COMMAND	FUNCTION	DESCRIPTION
ALL [*command*]	runs command in all directories	XT renamed
CD	same as DOS CD but uses C2DD	DOSKEY macro: C2DD $*
GO [*directory*]	jumps to specified directory	DOSKEY macro: GO=C2DD /C: DM $*
DDIR	displays two-column directory	DOSKEY macro: DDIR=SDL /2 $*
FEDIT [*file*]	finds file, loads it into DOS Edit	DOSKEY macro: FEDIT=GFF /E "EDIT {}" $*
MOVEDIR	moves directories	DOS's MOVE command renamed
TIMER	reports execution time of program or command	UPCT renamed
WHERE [*file*]	finds specified file	DOSKEY macro: WHERE=GFF $*
VIEW	views contents of directory	DR renamed

```
C:\DOS

ANSI.SYS       9065 APPEND.EXE    10774 ATTRIB.EXE    11208 CHKDSK.EXE    12241
CHKLIST.CPS    2592 CHKLIST.MS     2592 CHOICE.COM     1754 COMMAND.COM   54619
DEBUG.EXE     15718 DEFAULT.SET    4482 DEFAULT.SLT      21 DEFRAG.BAT      339
DEFRAG.EX~    79177 DEFRAG.HLP     9227 DELTREE.EXE    11111 DISKCOMP.COM  10748
DISKCOPY.COM  13335 DISPLAY.SYS   15789 DOSHELP.CPB     5667 DOSHELP.HLP     5667
DOSKEY.COM     5861 DOSSETUP.INI   3052 DOSSHELL.EXE 236378 DOSSHELL.INI     465
DOSSWAP.EXE   18756 DRIVER.SYS     5406 DRVSPACE.BAT    329 DRVSPACE.BIN  70279
DRVSPACE.SYS  15831 EDIT.COM        413 EGA.SYS         4885 EGAZ.CPI      58870
EMM386.EXE   120926 EXPAND.EXE    16129 FASTHELP.EXE   11481 FASTOPEN.EXE  12082
FC.EXE        18650 FDISK.EXE     29334 FIND.EXE        6770 FORMAT.COM     22916
GRAPHICS.COM  19742 GRAPHICS.PRO  21232 HELP.COM         413 HELP.HLP      296844
HIMEM.SYS     29136 INTERLNK.EXE  17197 INTERSVR.EXE   37426 KEYB.COM       15750
KEYBRD2.SYS   39366 LABEL.EXE      9390 LOADFIX.COM     1131 MEM.EXE        32502
MEMMAKER.EXE 119557 MEMMAKER.HLP  17237 MEMMAKER.INF    2911 MODE.COM       23569
MONOUMB.386    8703 MORE.COM       2545 MOUSE.COM      11846 MOUSE.SYS      11458
MOVEDIR.EXE   17823 MSAV.EXE     172198 MSAV.HLP       23891 MSAV.INI         248
MSAVHELP.OVL  29828 MSAVIRUS.LST  35520 MSBACKDB.OVL   63098 MSBACKDR.OVL   66906
MSBACKFB.OVL  69066 MSBACKFR.OVL  72474 MSBACKUP.EXE    5506 MSBACKUP.HLP  314236
MSBACKUP.OVL 133952 MSBCONFG.HLP  45780 MSBCONFG.OVL   47210 MSCDEX.EXE     25361
MSD.COM         867 MSD.EXE      158470 MSTOOLS.DLL     13424 MWAV.21P      204249
MWBACKF.DLL   14560 MWBACKR.DLL  111120 MWBACKUP.EXE  309696 MWBACKUP.HLP  400880
Press Q to quit or any other key to continue...
```

Figure 3. SDL's four-column option makes lengthy directory listings easier to read.

Sunny Listin'

If long directories that scroll off the screen drive you nuts, you need a utility that gives you a multicolumn listing. Lots of them are out there, but **Slick Directory Lister** (SDL) offers a nifty extra: You can get a listing of any directory on your hard disk without typing its full pathname. For example, the following command gives you a listing of the directory C:\DOCS\REPORTS\1995\BUDGETS\FINAL:

```
SDL FINAL
```

You can also type partial directory names, such as:

```
SDL FIN
```

If your disk contains more than one subdirectory that starts with the letters FIN, SDL pops up a selection box and lets you choose the one you want.

SDL also lets you choose a five-, four-, two-, or one-column display. The five-column listing, filenames only, squeezes 105 filenames onto your screen. The four-column display includes file sizes (**Figure 3**), the two-column option adds the time and date, and single-column mode tacks on attributes.

Aside from a few sorting and display options, SDL doesn't include many frills. But for squeezing giant directories onto a single screen and getting fast listings for directories ten levels deep, SDL is an elegant solution.

The program comes with three other utilities, including GFF (see below), as part of a package called **PDQ Utilities 2.0**.

Finding Files and More

There are lots of file finders available, but **Gonzo File Finder** (GFF) includes a few spiffy switches that, among other things, let you not only find a file, but run a program in one fell swoop. GFF's basic syntax is:

```
GFF [filename]
```

where *filename* is the name of the file for which you're looking.

When you use the program, it searches your hard disk and gives you a list of all matches. Nothing surprising or different there. What makes GFF interesting is its /E switch, which lets you specify a program to run after GFF finds a match. The switch permits solutions to two common problems: quickly editing a file in another directory and running a program to which your path doesn't point.

Let's look at the first problem. How often have you wanted to edit a batch file or a document in a directory other than the one in which you're working? You have to switch directories, load your text editor, and load the file. The process is tedious and prone to typos. GFF lets you do it all with a single command.

Say, for example, that you want to find a batch file called RUNIT.BAT and load it into DOS Edit. You type the following:

```
GFF /E "EDIT {}" RUNIT.BAT
```

GFF finds RUNIT.BAT, jumps you to the directory in which it resides, runs Edit, and loads RUNIT.BAT.

Now for the second problem: running programs DOS can't find in your path. For example, let's say you've got a utility called CHECKIT.COM, but you don't know where it is. The following command finds the program and runs it:

```
GFF /E "{}" CHECKIT.COM
```

For a program only 30K in size, GFF offers a remarkable number of features. Among the more notable are the following:

- switches that let you delete found files, with or without confirmation
- searches by date
- searches by a specified number of days prior to the current day
- searches for files containing a specific text string
- searches of multiple drives, including floppy drives
- the ability to go to the DOS prompt after each file is found (when you use wildcards)

GFF comes with three other utilities, including SDL (see above).

Move It!

Popular demand prompted Microsoft to introduce its own version of a MOVE command in DOS 5. But for some unfathomable reason, the development team chose to give it a different syntax from COPY.

While the following command copies all files on drive A to the current directory:

```
COPY A:*.*
```

the parallel command:

```
MOVE A:*.*
```

yields nothing but a "Required parameter missing" error message. Because I frequently must transfer files to and from drive A, I continue to use **Move**, a 10-year-old, 1840-byte public-domain utility. It's fast, and it supports moves such as:

```
MOVE \directory_path
```

which transfers all files in the specified directory to the current directory. In addition, you can rename files as you move them. For example, to move all TXT files on drive A to the current directory and change their extensions to DOC, you type:

```
MOVE A:*.txt *.doc
```

Alas, Move's drawback is that, unlike Microsoft's MOVE, it doesn't transfer directories. To keep this function available, I renamed DOS's MOVE command to MOVEDIR.

Text-File Viewer

The file viewer **DR 3.0** is one of three modules that work together to make up a disk-management system called **DirMagic**. The DR component is a revision of a program called **FILECTRL**, which appeared in *PC Magazine* in 1991.

Compared with postgraduate file viewers, DR is barely out of the first grade. It handles only pure ASCII files with any grace; it doesn't filter out all the special codes in documents created with most word processors. (They're readable, but you sometimes have to deal with a few odd symbols.)

Why, then, do I find myself using it dozens of times every day? One reason: a split screen that makes DR a great tool for cleaning out directories full of text and batch files. As you move your cursor down a list of filenames in the left panel, DR displays the contents of each file in the right panel (**Figure 4**). When you find a file you don't need, just press F2 to delete it.

DR accepts wildcards and lets you move up and down directory paths. It also lets you search for a file and jump to its directory. A special toggle lets you look at the directories of compressed files created with PKWare's PKZIP. Finally, you can search for specific text within a document you're displaying.

While I use DR almost exclusively as a document viewer, it includes several other features:

- It displays binary files.
- It lets you choose to display or run program files.
- It can print files with a filename header.
- It includes copy, move, and rename functions.
- It lets you change file attributes.

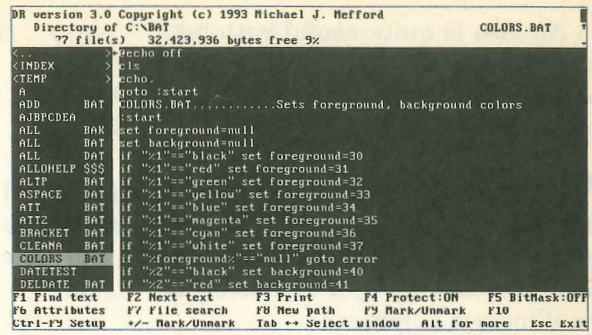


Figure 4. DR's best feature is a split screen that lets you scroll down a list of filenames in one panel and view each file's contents in the other panel.

DirMagic's main program, DM, provides a wider range of disk-management services. Most notably, you can put directory trees in two panels, then select two directories and compare and swap their contents. You can also select a directory and press a function key to run DR.

Note that DirMagic is the only program listed in this article that isn't shareware or freeware. Contact the vendor for purchasing information. FILECTRL, DR's predecessor, is available through ZiffNet. While it displays text files the same way DR does, it doesn't include most of DR's features described above.

Sweeping Changes

It's one of the great mysteries of DOS: Why doesn't the DEL command have an /S switch, the way DIR does?

If DEL did have such a switch, you could delete a set of files from any of your hard disk's subdirectories. Imagine how easy it would be to sweep your disk of those pesky TMP, BAK, and PRN files.

I haven't found a better solution than **XT 1.01**. Nearly a decade old, XT's durability is probably the result of its simplicity.

XT repeats any command in all directories of a given path, and that's it. The following command, for example, deletes all the PRN files on your hard disk:

```
XT C:\ DEL *.PRN
```

XT works with just about any command or batch file. Thus, to change all TXT extensions to DOC extensions in \MYDOCS, the command is:

```
XT C:\MYDOCS REN *.TXT *.DOC
```

XT offers several advantages over other sweepers I've used. First, it's much faster. XT executed a command in all directories in one minute and ten seconds; the similar AllSub from Foley Hi-Tech Systems took two minutes and 42 seconds. Second, you don't have to change directories to run XT in a specific path; you specify the path as a parameter. Other sweepers require you to move to the directory in which you want to run the program.

XT's one inconvenience is that you always have to include a directory name. However, if you're using XT for a single purpose, such as to wipe out all the PRN files on your hard disk, it's a simple matter to put the command with the appropriate parameters in a batch file.

Leave It Out

How many times have you wanted to delete every file in a directory except one? What you need is **No 2.0**, a file-exclusion utility that lets you excuse specified files from being included in an action. For example, to delete every file except SAVEME.TXT, type the following:

```
NO SAVEME.TXT DEL *.*
```

No also is quite useful with DIR, MOVE, and COPY, and I've even had occasion to use it with ATTRIB and REN.

Clip and Save

Clipcap 1.4 is a terrific little program that does one thing only: It captures DOS output and sends it to Windows' Clipboard.

Clipcap is the perfect little utility when you want to capture the output of a DOS command and insert it into a Windows word processor. For example, the following DOS command:

```
CHKDSK | CLIPCAP
```

stores the results of CHKDSK on the Clipboard.

You can also route the contents of a text file to the Clipboard. For example, to capture the contents of a file called README.TXT, type the following:

```
CLIPCAP <README.TXT
```

Typing CLIPCAP without parameters lets you send text to the Clipboard from the keyboard. Type your text and press Ctrl+Z.

Clipcap's companion program, **Clipread 1.0**, does the opposite: It displays the contents of the Windows Clipboard. Clipread is even simpler than Clipcap, permitting neither switches nor options. You just type CLIPREAD and the contents of the Windows Clipboard are displayed on your screen.

Clipread lets you redirect text to a file. The following command, for instance, creates the file called NOTE.TXT and stores the contents of the Clipboard in the file:

```
CLIPREAD > NOTE.TXT
```

Note that Clipread handles text only; it doesn't display graphics.

A Timer for Every Purpose

Ultra Precision Command Timer 1.5 (UPCT) is a kind of software stopwatch that lets you measure the execution time of any command or batch file.

To use it, you type UPCT followed by the command sequence. For example, to find out how long it takes the batch file MYBAT.BAT to execute, you type:

```
UPCT MYBAT.BAT
```

When MYBAT.BAT ends, UPCT reports the elapsed time in seconds and microseconds.

This utility's uses are limited compared with those of other programs I've mentioned; not everybody needs to know how long it takes their programs to run.

But I've found UPCT an indispensable tool for comparing the performance of several utilities that do the same task. I used it often while preparing this article, as a matter of fact; see, for example, the timing results reported for the sweep utilities XT and AllSub (opposite).

UPCT is also a great tool for batch-file programmers: You can try two techniques for performing a task and use UPCT to find out which is more efficient.

PRODUCT INFORMATION

Directory Maven 1.2
Kent Briggs
109A Romana Circle
Hewitt, TX 76643
CompuServe: **72124,3234**
copyrighted freeware

C2DD 1.0
David M. Wincelberg
FileJockey Software
289 South Robertson Boulevard
Suite 373
Beverly Hills, CA 90211
CompuServe: **71573,1023**
copyrighted freeware

PDQ Utilities 2.0
Gerald M. Vrooman
6400 NY RT 79
Chenango Forks, NY 13746
$25 four-utility shareware package
includes Super Directory Lister
and Gonzo File Finder

Move
Craig Derouen
public-domain software

DirMagic
MJM Software Design
P.O. Box 129
Gleneden Beach, OR 97388
800-690-4499
$39.95
includes DR

XT 1.01
Christopher J. Dunford
10057-2 Windstream Drive
Columbia, MD 21044
301-992-9371
copyrighted freeware

No 2.0
Foley Hi-Tech Systems
185 Berry Street
San Francisco, CA 94107
415-882-1730
BBS **415-882-1735**
$19.95 shareware

Clipcap 1.4
Clipread 1.0
Brian Sawert
1109 South Plaza Way #427
Flagstaff, AZ 86001
CompuServe **72027, 2143**
Internet **bsawert@primenet.com**
copyrighted freeware

Ultra Precision Command Timer 1.5
Erik de Neve
CompuServe **100121,1070**
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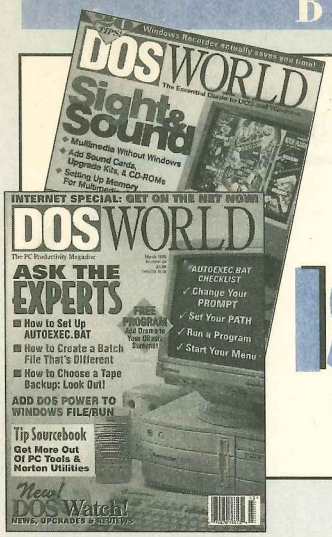

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Put Your Best File Forward

If you're looking to increase memory and improve computing efficiency, the place to begin is your CONFIG.SYS file.

by Ken Johnson

When you start your computer, what kind of messages does CONFIG.SYS send to your system? In what order does it send those messages? Who wants to know? You do—or at least you should.

CONFIG.SYS is one of the most important files on your computer: It's the program responsible for configuring your PC when it boots up. If you use MS-DOS 5 or 6.x, it handles tasks such as memory allocation, loading the device-driver programs that control certain hardware, and setting up DOS to function efficiently with your programs.

A few years ago, many computers didn't need a CONFIG.SYS file; then the advent of memory-management software and add-ons such as mice and CD-ROMs made it a necessity. More recently, the arrival of Windows 95 and its attendant hardware and software has signaled the beginning of the end for CONFIG.SYS. (See the accompanying sidebar, "Still in the Running," page 40.) But its total demise isn't likely to come anytime soon.

If you're one of the millions of users who continue to rely on older equipment and programs, you still need a CONFIG.SYS to get your system going. To keep things running at top efficiency, you also need to make sure that CONFIG.SYS is well tuned. That means not only being careful about where you load the necessary device drivers, but also ensuring that CONFIG.SYS doesn't contain commands that decrease performance or waste memory.

What, Where, When

Unlike most other DOS files that end in the extension SYS, CONFIG.SYS isn't a binary program file; it's a text file. As with the other start-up text file, AUTOEXEC.BAT, DOS expects to find CONFIG.SYS in the root directory of your system's boot drive.

To reconfigure your system, you must edit one or both of these start-up files. For that, you need a text editor that saves files in ASCII (text) format. DOS's own Edit program (EDIT.COM) is equal to the task. If you prefer to work in Windows 3.1, SysEdit is your best bet. (Choose File/Run in Program Manager or File Manager and type SYSEDIT to run the program and load your important system files.) To put CONFIG.SYS changes into effect, however, you must reboot.

Speaking of modifications, many applications' installation programs modify CONFIG.SYS. Although the better programs tell you they're about to make changes and create a backup copy before altering anything, some programs don't warn you. For that reason, it's a good idea to make copies of both CONFIG.SYS and AUTOEXEC.BAT before installing software. Of course, you should also make backups before modifying these files yourself. That way, you can compare the before and after files if DOS refuses to boot properly.

To keep track of what changes are made when, I copy backups of my CONFIG.SYS and AUTOEXEC.BAT files to a subdirectory called \CONFIG. I also use dated file extensions so that I'll know when I did the copying. The extension 315, for instance, tells me that I copied the file on March 15. For October through December, I employ hexadecimal notation, using A for files copied in October, B for November, and C for December. A file copied on Christ-

mas Day, for instance, would carry the extension C25.

At Your Command

CONFIG.SYS accepts a variety of statements; you can type HELP CONFIG.SYS at the DOS prompt to see a complete list. The following are the most important configuration statements; the accompanying listing, MYCONFIG.SYS (below), shows them in action:

• **HIMEM.SYS and EMM386.EXE.** The first commands in CONFIG.SYS should load your memory managers. MS-DOS's built-in memory-management team consists of HIMEM.SYS and EMM386.EXE, which you load via a DEVICE statement:

```
DEVICE=[pathname]program
[switch1...switch2...]
```

HIMEM.SYS, which manages extended memory, must load before EMM386.EXE, which provides expanded-memory service and access to your computer's upper-memory blocks, an area into which you can load device drivers and memory-resident programs. Loading programs into UMBs conserves conventional (low) memory for your word processor, spreadsheet, and other applications.

In the example program, MYCONFIG.SYS, you'll notice that I use complete pathnames in all commands. That's an absolute necessity. Because AUTOEXEC.BAT executes after CONFIG.SYS, at this point DOS knows nothing about the directories mentioned in your AUTOEXEC.BAT's PATH statement. If you don't provide a pathname, DOS won't be able to find the programs you want to load unless they're in the root directory.

Both the opening HIMEM.SYS statement and the EMM386.EXE statement also include the optional switch /V (verbose). This switch tells DOS to display the programs' start-up messages, something I find useful when troubleshooting boot-up problems. The line that loads EMM386.EXE contains two other switches, as well. RAM tells DOS to make expanded memory (EMS) available to programs that require it. Because I don't list a range of memory addresses (the proper syntax is I=*MMMM-NNNN*), EMM386.EXE uses all available space to create UMBs and a *page frame*, an area used for swapping information into expanded memory when your program needs data. To provide access to UMBs but not to expanded memory, use the NOEMS switch instead. This frees up an additional 64K of upper memory, the amount of space reserved for the page frame when you use the RAM switch.

DOS's memory optimization program, MemMaker, added the parameter HIGHSCAN, because I wanted it to free up as much conventional memory as possible by scanning upper memory aggressively.

In MYCONFIG.SYS, the command DEVICE=C:\ALTPAUSE.SYS separates the HIMEM and EMM386 commands. This short program helps me troubleshoot boot-up problems. When DOS loads the commands in your CONFIG.SYS, their messages usually scroll off the screen before you can read them. ALTPAUSE.SYS lets you temporarily pause CONFIG.SYS by pressing an Alt, Ctrl, or Shift key. When you release the key, execution continues. I have a comparable utility, ALTPAUSE.COM, that performs the same function in AUTOEXEC.BAT. Both programs are available on the *DOS World* BBS (See page 72 for dialing instructions.)

Note that MYCONFIG.SYS loads ALTPAUSE.SYS several times; this is necessary because the program isn't memory resident. You have to load it after each command where you'd like the option of pausing.

• **DOS.** The DOS command follows HIMEM and EMM386. If you want to free up maximum conventional memory (and who doesn't?), use this command in your CONFIG.SYS. You may write it as one command:

```
DOS=HIGH,UMB
```

or separate it into two commands:

```
DOS=HIGH
DOS=UMB
```

If you use MemMaker after setting up the DOS command as one, it's separated into two commands.

MYCONFIG.SYS is a stripped-down version of the author's CONFIG.SYS file.

```
DEVICE=C:\DOS\HIMEM.SYS /V
DEVICE=C:\ALTPAUSE.SYS
DEVICE=C:\DOS\EMM386.EXE RAM HIGHSCAN /V
DEVICE=C:\ALTPAUSE.SYS
DOS=DOS,UMB
BUFFERS=15
FILES=60
LASTDRIVE=E
STACKS=32,512
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /P /E:512
DEVICEHIGH /L:1,24320 =C:\CDROM\NEC_IDE.SYS /D:NECCD0
DEVICE=C:\ALTPAUSE.SYS
DEVICEHIGH /L:1,9072 =C:\DOS\ANSI.SYS
DEVICE=C:\ALTPAUSE.SYS
```

End

DOS=HIGH tells DOS to load part of itself into the high-memory area (HMA), the first 64K above the 1MB mark. DOS=UMB makes the upper-memory blocks, unused memory between 640K and 1MB, available for loading drivers and memory-resident programs.

• **BUFFERS.** DOS uses buffers—areas set aside in memory—to hold data when reading from a disk and, optionally, writing to a disk. You use a BUFFERS command to indicate how many of these areas you need. This command, for example, tells DOS to set up 20 buffers:

```
BUFFERS=20
```

Each buffer consumes about 500 bytes of memory. If your CONFIG.SYS includes a DOS=HIGH statement, the buffers load into the HMA, which conserves conventional memory.

If you use a disk cache, such as DOS's SmartDrive, set BUFFERS to about 15. In some cases, setting aside too many buffers slows your system, because DOS will spend more time looking in its buffers than it would if it went to the disk cache or if it read the information

STILL IN THE RUNNING

Someday, most Windows users may be able get by without a CONFIG.SYS file. For the short term, though, most users who upgrade to Win95 will have to content themselves with a trimmer CONFIG.SYS.

Several commands may disappear entirely, because their functions are incorporated into the DOS initialization file IO.SYS. Among them are HIMEM.SYS, SETVER.EXE, and DBLSPACE-.BIN or DRVSPACE.BIN. Other programs now incorporated into Win95 are a disk cache, as well as mouse, CD-ROM, sound, and network-card drivers. These new drivers run in protected mode, which means they automatically load into a portion of memory above the 1MB mark. You no longer need a DEVICE statement to load them or a DEVICEHIGH statement to load them high. Luckily, you don't have to worry about getting rid of your old drivers. Win95 takes care of that during installation, removing references to real-mode drivers for which it has protected-mode replacements.

Naturally, if Win95 doesn't have a protected-mode version of one of your real-mode drivers, your CONFIG.SYS will need to include a command to load that driver. There are several other reasons why you may still need some of your old CONFIG.SYS commands after upgrading to Win95:

- IO.SYS doesn't load EMM386.EXE. Without this program, you don't have access to expanded memory. If one or more of your programs needs it, be sure to include HIMEM.SYS, EMM386-.EXE, and DOS=HIGH,UMB commands in your CONFIG.SYS. Don't forget to include the switch RAM in the EMM386 command.
- You need more conventional memory for your DOS programs. Again, include HIMEM.SYS, EMM386.SYS, and DOS=HIGH,UMB commands. Then use the DEVICEHIGH command to load drivers into upper memory.
- You want values for FILES, BUFFERS, LASTDRIVE, and STACKS that differ from those IO.SYS establishes as defaults:

```
FILES=60
BUFFERS=30
STACKS=9,265
LASTDRIVE=Z
```

To override Win95's settings, simply include the appropriate command in CONFIG.SYS.

If you upgrade to Win95 over a previous version of DOS and Windows and don't overwrite your Win3.1 directory, you have another wrinkle to consider: You actually have two configuration files. Your Win95 setup file is called CONFIG.SYS; the one for your old setup is called CONFIG.DOS.

If you let Win95 handle boot-up, it looks in CONFIG.SYS for your start-up settings. If you boot to your previous version of DOS by pressing F4 when you see the "Starting Windows 95" message or by pressing F8 and choosing option 8 from the start-up menu, the settings in CONFIG.DOS are executed. Any changes you make to this configuration file are saved back to CONFIG.DOS when you reboot to Win95.

As comforting as it is to have the option of returning to your old DOS and Windows, you shouldn't resort to that unless you really must. When you go back to your old operating system, you sacrifice the performance gains you made by upgrading to Win95. You also have a bit less conventioanl memory, because the protected-mode drivers Win95 uses don't take up any memory below the 1MB mark. Win3.1's real-mode drivers do.

If you have a DOS program that misbehaves under Win95, don't immediately assume that you'll have to shut down and reboot to your old DOS. First, try setting up the program to run in Win95's MS-DOS mode. To do that, right-click on the program's name or its shortcut icon and choose Properties. Click on the tab for the Program sheet, then on the Advanced button. From the Advanced Program Settings dialog box, select the New MS-DOS Configuration button to activate the rest of the window. Click on the Configuration button and choose the options you want:: EMS and Disk Cache, for example. Win95 will then fill in the AUTOEXEC.BAT and CONFIG.SYS sections. You can add other drivers and programs as needed.

Running an MS-DOS mode program couldn't be simpler. When you double-click on its icon or shortcut, Win95 shuts down, warm-boots to MS-DOS, and runs the program. When you exit the program, Win95 reboots.

—K.J.

from disk. On many systems, this slowdown becomes noticeable when the BUFFERS setting climbs above 60. Because I use SmartDrive, the BUFFERS setting in MYCONFIG.SYS is set to 15.

• **FILES.** The FILES statement sets the number of files DOS allows open at one time. This command, for instance, permits 20 open files:

```
FILES=20
```

If you set the number of files too low, your may receive a "Not Enough File Handles" message. As with buffers, increasing the number of files doesn't decrease conventional memory if you load DOS high.

A setting of 60 is usually sufficient for most programs, although databases may require more. Usually, an application's installation program will increase the FILES setting if it's too low. To satisfy the needs of several heavy-duty applications, including WordPerfect, MYCONFIG.SYS sets FILES to 60.

• **FCBS.** File-control blocks (FCBs) are data structures that store information about a file. Older DOS programs need such blocks to open multiple files. The FCBS command's syntax is similar to that for FILES and BUFFERS:

```
FCBS=8
```

If you omit this command from CONFIG.SYS, DOS sets aside four file-control blocks. Because I don't run any programs requiring more than four blocks, MYCONFIG.SYS doesn't include an FCBS statement.

• **LASTDRIVE.** The LASTDRIVE commands limits the number of drives you may access. This command, for instance, lets you use eight drives:

```
LASTDRIVE=H
```

If your CONFIG.SYS doesn't include a LASTDRIVE statement, DOS lets you access one drive more than the number of physical drives (floppy drives, hard drives, and CD-ROM drives) and logical drives (RAM disks and compressed disks) in use on your system.

Be sure you don't set the value of LASTDRIVE too high. For each drive letter you make available, DOS needs about 80 bytes of memory. My computer, for example, has a floppy drive (A), a hard drive (C), and a CD-ROM (D). Consequently, MYCONFIG.SYS sets LASTDRIVE to E. If I set it to Z, I'd be wasting about 2K of memory.

• **STACKS.** Stacks are temporary holding areas in memory. When a hardware interrupt (a request for service, such as a disk read or write) occurs, DOS stores the information on which it's acting in a stack so that your system can devote its attention to handling the interrupt.

When you issue a STACKS command, indicate both the number of stacks you want and the size (in bytes) of each stack. This command, for example, sets aside nine stacks of 128 bytes each:

```
STACKS=9,128
```

Because interrupts can occur while your system is acting on other interrupts, DOS may run out of space if your STACKS setting is too low. When that happens, you receive an "Internal stack failure, system halted" message. To solve the problem, you'll need to reboot, increase the STACKS setting, and reboot again to put this change into effect.

The STACKS setting in MYCONFIG.SYS is unusually high because I do a great deal of multitasking and I've unfortunately experienced stack-overflow problems. Because I hate rebooting, I've cranked up the setting to eliminate the trouble. I can afford to do that because I have plenty of memory to spare.

• **SHELL.** DOS's SHELL statement indicates which command interpreter you want to use. If you use DOS's own COMMAND.COM, you don't need to include this command, provided you store it in your root directory, where DOS searches for it.

Because I store COMMAND.COM in my C:\DOS directory, MYCONFIG.SYS contains a SHELL command. Although SHELL doesn't accept parameters, COMMAND.COM does. MYCONFIG.SYS includes two of them:

```
SHELL=C:\DOS\COMMAND.COM C:\DOS /P
  /E:512
```

/P makes the copy of COMMAND.COM that's loading permanent. Doing that ensures that the command interpreter doesn't stop if you type EXIT and also forces DOS to execute AUTOEXEC.BAT when it finishes executing CONFIG.SYS. /E:512 expands the environment from its default size of 256 bytes (for DOS 5 and 6.x) to 512 bytes.

• **DEVICE** and **DEVICEHIGH.** You use a DEVICE statement to load the driver programs for hardware such as CD-ROM drives and your mouse, as well as to start ANSI.SYS, RAMDRIVE.SYS, and, of course, HIMEM.SYS and EMM386.EXE. (ANSI.SYS lets you add color to your DOS screen or change your keyboard's key assignments. RAMDRIVE.SYS lets you set up a portion of memory to act as a disk drive.)

A DEVICEHIGH statement tells DOS to load a particular driver into your system's UMBs. When you run MemMaker, it changes as many DEVICE statements as possible into DEVICEHIGH statements, adding the parameter /L and a value indicating the size of the driver and the region of memory in which it's stored. You can't use DEVICEHIGH with HIMEM and EMM386, because you haven't created the UMBs yet. The DOS command, which comes later, does that.

The first DEVICEHIGH statement in MYCONFIG.SYS loads my CD-ROM driver. The switch /L:1,24320 indicates that the driver loads into

The sample program CONFIG.MUL shows how to create a CONFIG.SYS file that lets you choose among several setup options.

```
[MENU]
MENUITEM=QEMM,QEMM386 Boot
MENUITEM=MSDOS6,MS-DOS 6.2 HIMEM boot
MENUITEM=MINIMUM,Plain Vanilla Boot
MENUCOLOR=15,0
MENUDEFAULT=QEMM,10

[QEMM]
DEVICE=C:\QEMM\QEMM386.SYS RAM NOSH DBF=2 X=B000-B800
DOS=HIGH
DEVICE=C:\QEMM\LOADHI.SYS /R:3 C:\DOS\ANSI.SYS /X

[MSDOS6]
INCLUDE=MINIMUM
DEVICE=C:\DOS\EMM386.EXE RAM
DOS=HIGH,UMB
DEVICEHIGH=C:\DOS\ANSI.SYS /X

[MINIMUM]
DEVICE=C:\DOS\HIMEM.SYS

[COMMON]
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /E:512 /P
STACKS=17,256
BUFFERS=15
FILES=60
LASTDRIVE=E
```

End

memory-region 1 and takes 24,320 bytes of memory. The last DEVICEHIGH statement loads ANSI.SYS.

Bypassing CONFIG.SYS

Many people never experience problems with their CONFIG.SYS files; they probably never tinker with their start-up files or upgrade their hardware themselves.

If you're the sort of person who does, though, you'll probably run into boot-up problems now and then. MS-DOS version 6.x offers three ways of selectively overriding your CONFIG.SYS commands and uncovering the cause of your troubles: performing a clean system boot, performing an interactive boot, and confirming individual commands.

To clean-boot your system, bypassing CONFIG.SYS and AUTOEXEC.BAT, press the F5 key when you see the "Starting MS-DOS..." message. DOS will use its bare-bones start-up settings. This minimum configuration includes settings such as PATH=C:\DOS, PROMPT=PG, and COMSPEC=C:\COMMAND.COM.

To disable the clean-boot option, place a SWITCHES=/N command in CONFIG.SYS. (Anywhere will do.) Inserting a SWITCHES=/F command tells DOS not to pause for two seconds after displaying its "Starting MS-DOS...." message.

To start an interactive boot, which lets you bypass one or more CONFIG.SYS options, press F8 when you see the "Starting MS-DOS..." message. DOS will display each line of the file and ask whether you want to execute it. If you have MS-DOS 6.2, DOS prompts you through AUTOEXEC.BAT after finishing with CONFIG.SYS. If you have MS-DOS 6.0, it displays a "Process AUTOEXEC.BAT [Y,N]?" message. If you press Y, DOS executes your entire AUTOEXEC.BAT; pressing N tells DOS to bypass the entire file.

During an interactive boot, you can process all the remaining commands in both files by pressing the Esc key. As with a clean boot, adding the line SWITCHES=/N to CONFIG.SYS disables this option.

If you want the option of bypassing a certain command every time you boot, insert a question mark into the command before the equal sign:

```
DEVICE?=C:\DOS\ANSI.SYS
STACKS?=32,512
```

Whenever it encounters a CONFIG.SYS command containing a question mark, DOS asks whether you want to execute it.

Multiple-Choice Tests

MS-DOS 6.x offers one other very useful feature: the ability to choose among several setup options whenever you boot your system. To take advantage of this feature, you create a start-up menu containing as many as nine items; each menu item is associated with a different section of your CONFIG.SYS and AUTOEXEC.BAT files. That means you can configure your system differently when you need to run certain programs. For instance, if several of your games require exceptional amounts of memory, you can create a maximum-memory option and choose that whenever you want to play those games.

Setting up a multiple-configuration menu is a three-step process:

1. Create a start-up menu in your CONFIG.SYS file.
2. Create a configuration block in CONFIG.SYS for each unique setup.
3. Alter your AUTOEXEC.BAT so that DOS branches to the correct part of AUTOEXEC.BAT for the menu selection you make when CONFIG.SYS executes.

Your start-up menu must begin with the header [MENU], followed by as many as nine MENUITEM commands. The command syntax looks like this:

```
[MENU]
MENUITEM=blockname,menutext
```

blockname is the name you want to assign to the menu item; *menutext* is the information you want to provide about that selection. If you like, you may create submenus (SUBMENU=), set colors (MENUCOLOR=), and create a default menu option for DOS to select automatically after a specified period of time elapses (MENUDEFAULT=).

A configuration block begins with a block header: a configuration name enclosed in square brackets. It must correspond to a block name in your MENUITEM command. For instance, in the sample multiple-configuration program CONFIG.MUL (opposite), the menu item MSDOS6 corresponds to the configuration block labeled [MSDOS6].

In each configuration block, you list the CONFIG.SYS commands you want to execute for that selection. For convenience, you may use the INCLUDE command to tell DOS to execute all the commands for another configuration block. You can also supply a configuration block called [COMMON] and fill it with commands you want DOS to execute for all menu selections.

When you choose a menu item in a multiple-configuration CONFIG.SYS, DOS creates a CONFIG environment variable containing the name of the selected configuration block. In AUTOEXEC.BAT, you code labels with each configuration block name, then list the commands for that selection after the label. You use a GOTO %CONFIG% statement to branch to the specific label and execute the commands it finds there. A typical seqeunce might look like the program fragment shown in MYAUTO.BAT (right).

The menu in CONFIG.MUL offers three bootup options:

```
MENUITEM=QEMM,QEMM386 Boot
MENUITEM=MSDOS6,MS-DOS 6.2 HIMEM boot
MENUITEM=MINIMUM,Plain Vanilla Boot
```

When you choose the first one, QEMM, DOS uses Quarterdeck Software's memory manager. When you choose the second option, DOS uses its built-in memory managers, HIMEM.SYS and EMM386.EXE. The third option starts a basic setup. If you don't make a choice within ten seconds, DOS starts the system using the QEMM settings.

Notice that the block called [MSDOS6] includes the commands from the [MINIMUM] block. The [COMMON] block at the end of the file contains the statements common to all three configurations, including SHELL, BUFFERS, and LASTDRIVE. The MENUCOLOR command tells DOS to display the menu in bright-white text on a black background.

It's a Setup

As is often the case with DOS and its inner workings, the terminology can sometimes get in your way. If you're at all intimidated at the daunting prospect of *configuring your system*, just think of it simply as *preparing your computer*.

Doing it right takes a bit of forethought, of course, but the basic concept is pretty down-to-earth: Use only the DOS commands you need and make every effort to conserve memory. Your reward will be better system performance and enough RAM to load the applications on which you depend. ■

The sample program MYAUTO.BAT shows how to set up your AUTOEXEC.BAT to work with a multiconfiguration CONFIG.SYS. Note overflow in second line (PATH= ...) of :QEMM section.

```
@ECHO OFF
PROMPT $P-$G
GOTO %CONFIG%

:QEMM
PATH=C:\QEMM;C:\DOS;C:\;C:\WINDOWS;C:\WINMAST;C:\PCKWIK;C:\UTIL;
  D:\NU;C:\ZIP
ALTPAUSE
C:\QEMM\LOADHI /R:1 C:\WINDOWS\MOUSE
ALTPAUSE
C:\DOS\DOSKEY /BUFSIZE=1024 /INSERT
ALTPAUSE
C:\QEMM\LOADHI /R:1 /LO C:\PCKWIK\SUPER
ALTPAUSE
C:\QEMM\LOADHI /R:1 C:\PCACHE\PCACHE
ALTPAUSE
GOTO END

:MSDOS6
PATH C:\DOS;C:\;C:\WINDOWS;C:\WINMAST;C:\UTIL;D:\NU;C:\ZIP
LH /L:0;1,45472 /S C:\DOS\SMARTDRV.EXE /V C F E
ALTPAUSE
C:\WINDOWS\MOUSE
ALTPAUSE
C:\PCACHE\PCACHE
ALTPAUSE
LH /L:1,6384 C:\DOS\DOSKEY /BUFSIZE=1024 /INSERT
ALTPAUSE
GOTO END

:MINIMUM
PATH C:\DOS;C:\;C:\WINDOWS;C:\WINMAST;C:\UTIL;D:\NU;C:\ZIP
C:\WINDOWS\MOUSE
C:\DOS\DOSKEY /BUFSIZE=1024 /INSERT
GOTO END

:END
CALL DKMACROS
[other commands not shown]
```

End

The FAQs on DOS Disk Compression

Dreaming of more hard-disk space? This collection of 14 frequently asked DriveSpace questions will give you the knowledge you need to go out and get it.

by Doug Lowe

Lack of storage space is one of the most common problems plaguing PC users today. While those with 200MB or 300MB hard drives are most likely to suffer from acute disk congestion, even people with 1GB drives are at times hard pressed to find free disk space.

With the cost of hard drives falling rapidly, one solution to the problem is to purchase a drive with higher capacity. But a cheaper, and sometimes easier, solution is to get more mileage from the space you have—by using the DriveSpace disk-compression software that comes with MS-DOS.

If you've rejected this alternative as being too confusing or fraught with danger, you owe it to yourself to get the facts. If you take the necessary precautions before and after installing DriveSpace, not only will your data be safe, it will also have plenty of room to grow.

FAQ #1 What are the benefits of using DriveSpace?

The main reason for using DriveSpace, of course, is to increase the effective capacity of your hard disk. DriveSpace can typically double your disk's capacity, so if you have a 200MB hard drive, DriveSpace will generally let you store 400MB of data on it.

Another, less widely known, benefit of DriveSpace is that it lets you partition your hard drive into two or more drives, without reformatting the entire drive.

Many users like to partition their hard disks into two drives: C for storing programs and D for storing data. In the past, creating these partitions—or changing their relative sizes—was a tedious, all-day affair. But with DriveSpace, you can create and resize disk partitions at will, without reformatting the drive or losing data.

FAQ #2 Are there any drawbacks to using DriveSpace?

DriveSpace's biggest shortcoming is that it complicates your computing: It's one more piece of software with which you must contend.

You certainly don't have to be a computer expert to use DriveSpace, but you do have to learn a little about how it works, and you have to use a few commands to set it up. Fortunately, after you do that, DriveSpace pretty much takes care of itself and needs only occasional attention.

But note that on slower computers, especially older 386-based systems, DriveSpace may slow disk access. On faster computers, the slowdown is negligible; on the fastest computers, DriveSpace may actually speed up disk access.

Another drawback few users consider is that once you compress a drive, the DriveSpace device driver must be present in memory to access the data on the drive. This driver eats up 38K of RAM; if your upper memory is already packed full, DriveSpace will load its driver into conventional memory, which will reduce the amount of memory available to your applications.

FAQ #3 Is DriveSpace safe to use on my hard disk's data?

Yes. DriveSpace has been thoroughly tested and doesn't increase or decrease the risk of losing hard-disk data.

Probably the most common cause of lost data is turning off the computer without first closing files and exiting all programs, including Windows. That can corrupt your data by creating lost clusters or cross-linked files, whether or not you use DriveSpace.

When Microsoft first introduced disk compression in MS-DOS 6.0, many users complained about losing data because of its disk compressor, DoubleSpace. Microsoft never found irrefutable evidence that bugs in DoubleSpace were responsible for such problems, but, nevertheless, it released DriveSpace, a safer version of DoubleSpace, in MS-DOS 6.2. If you still use MS-DOS 6.0 and you want to try disk compression, I strongly urge you to upgrade to DOS 6.22 before compressing your disk.

The actual process of compressing a disk is itself very safe. Microsoft went to great lengths to ensure that DriveSpace can recover from a power loss at any moment during the compression process.

To prove the point, during the media launch of DOS 6.0 Bill Gates himself unplugged a computer while it was compressing data. Sure enough, when he plugged the computer back in, DriveSpace just picked up where it left off, with no data loss.

FAQ #4 How does compression work?

There's nothing magic about it. Disk compressors like DriveSpace simply take advantage of the fact that most files on your disk contain a surprising amount of redundant information. For example, this paragraph contains the word *redundant* three times. DriveSpace sniffs out and eliminates repeated text, so that redundant information is stored on disk only once.

FAQ #5 What do *host drive* and *compressed volume file* mean?

For most users, the most confusing aspect of using DriveSpace is the terminology. Let's look at a few of the most important phrases you'll need to know when dealing with DriveSpace.

When you use DriveSpace to compress a disk, the program stores the compressed data in a special file called a CVF, or *compressed volume file*. It assigns this CVF a drive letter so that you can access the compressed data as though it were on a separate disk drive. The drive letter referring to the section of the disk housing compressed data is called a *compressed drive*; the drive letter referring to the section of the disk housing the uncompressed data and the CVF is called a *host drive*.

The confusion doesn't end there, though. After DriveSpace assigns a new drive letter to the compressed drive, it switches the letters of the compressed and host drives, so that you can access the compressed data using the same drive letter you used originally to access the data before it was compressed.

If all this seems confusing, consider what happens when you use DriveSpace to compress a drive designated as drive C. DriveSpace starts by moving all data from drive C into a CVF, compressing the data as it goes.

When it has compressed all the data, DriveSpace picks a drive letter—in most cases, H—and assigns it to the compressed data in the CVF. Then it switches the drive letters used for the original drive (now called the host drive) and the compressed drive.

As a result, you access the compressed data in the CVF as drive C, and the uncompressed portion of the host drive as drive H.

FAQ #6 What does *compression ratio* mean?

The compression ratio is the amount of disk space used to store an uncompressed file divided by the amount of space required to store the file after it's compressed. For example, if a file takes up 16K in uncompressed form but requires only 4K when compressed, the compression ratio is 4 to 1.

With disk compressors such as DriveSpace, note that there are two types of compression ratios. The *actual compression ratio* (ACR) is a measure of the compression ratios for all files stored on a compressed drive. The *estimated compression ratio* (ECR) is a best guess at the ratio you'll achieve for files you'll store on the drive in the future.

ECR is used to figure the amount of free space remaining on a compressed drive and underscores one of the most important facts to keep in mind when using DriveSpace: You never know for sure how much free space a compressed drive contains. You can only estimate it.

FAQ #7 How much more space can I expect to get by compressing my disk?

The amount of free space you get from DriveSpace depends on how well the individual files on your disk compress.

Different types of files compress at different rates. Program files (those with extensions such as EXE, COM, and DLL, for example) usually yield compression ratios of between 1.5 to 1 and 2.0 to 1. Document files achieve ratios of from 2.0 to 1 to 4.0 or more to 1. Some types of graphics files show even higher compression ratios.

If you have trouble relating to ratios, consider what would happen if you compressed a 500K file.

```
C:\>mem

Memory Type        Total      Used       Free
----------------  --------  --------  --------
Conventional         640K       27K      613K
Upper                155K       91K       64K
Reserved             384K      384K        0K
Extended (XMS)     3,072K    1,140K    1,930K
----------------  --------  --------  --------
Total memory       4,096K    1,472K    2,624K

Total under 1 MB     795K      103K      692K

Largest executable program size       613K (627,808 bytes)
Largest free upper memory block        78K  (80,256 bytes)
MS-DOS is resident in the high memory area.

C:\>
```

Figure 1. Before using DriveSpace to compress a hard disk, use the MEM command to ensure that you have enough upper memory for the DriveSpace device driver.

A 4:1 ratio would reduce the file to 125K. With a 2:1 ratio, the file would be 250K; at 1.5:1, 333K.

You can use the following steps to get a somewhat pessimistic estimate of how much free space you'll have after compressing with DriveSpace. These instructions assume that you're running Windows 3.1:

1. Use DOS's CHKDSK command to find out the total capacity of your drive and the amount of free space remaining on the drive.
2. Determine the size of Windows' permanent swap file by typing the command `DIR C:\ /AH` and noting the size of the file named 386PART.PAR. Then subtract this size from the drive capacity to determine the usable drive capacity. (DriveSpace can't compress your permanent swap file.)
3. Subtract the size of the permanent swap file and the amount of free space from the total drive capacity to determine the amount of data that can be compressed.
4. Subtract the size of Windows' permanent swap file from the total drive capacity; then subtract 2 to determine the amount of space available for DriveSpace's CVF.
5. Divide the amount of data to be compressed (step 3) by 1.7. Then subtract this result from the amount of space available for the DriveSpace CVF (step 4). This gives you the amount of free space in the CVF.
6. Multiply the amount of free space in the CVF by 2 to determine the amount of free space that will result after DriveSpace compression, assuming an estimated compression ratio of 2.0 to 1.

For example, suppose you have a 200MB drive with a 6MB swap file and 9MB of free space. The usable capacity for this drive is 192MB (200 minus 6 minus 2); the amount of data to be compressed is 185MB (200 minus 9 minus 6). The amount of free space that will remain in the CVF is 84MB (192 minus 185 divided by 1.7), which means that the amount of free space after compressing the disk will be 168MB (84 times 2).

Remember that the amount of free space reported for a compressed drive depends on the ECR. DriveSpace initially assumes that files added to the drive will compress at a ratio of 2.0 to 1, so the ECR is 2.0. That may not accurately predict how well your files will compress.

Many users are disappointed when they first run DriveSpace because it reports a compression ratio of less than 2.0 to 1. In fact, a more typical compression ratio is 1.7 to 1 or 1.8 to 1; that's why the preceding formula for estimating free space uses 1.7 in step 5.

Keep in mind, though, that the files already on your hard disk include program files for Windows and your other software, which typically compress at less than 2.0 to 1. If the files you're likely to store in the remaining free space are mostly data files, you'll get a compression ratio of higher than 2.0 to 1.

FAQ #8 How long will it take to compress my hard disk?

The length of time DriveSpace needs to compress your hard disk depends on two factors: the amount of data to be compressed and the speed of your computer. Typically, DriveSpace can compress 1MB of data per minute, so 180MB of data will take three hours. You also need to figure in the time required to perform a surface scan. (DriveSpace does that automatically.)

FAQ #9 Do I need to take any precautions before compressing?

Absolutely. Don't compress your hard drive without first making a complete backup. Not that I'm paranoid, and in fact I've never lost a byte of data to a DriveSpace failure, but I wouldn't change my system's configuration without first making sure I have a complete backup. (Of course, you do daily backups anyway, so that's no problem, right?)

Also make sure your drive contains sufficient free space before proceeding. You need at least 1.2MB of free space on your boot drive, but I'd allow a bigger margin than that. Free up at least 5MB if you can.

Check to make sure that you can spare the 38K of RAM required by DriveSpace's device driver. To do that, start by executing the command `MEM` at the DOS prompt.

Note that the next-to-last line of the report shows the size of the largest free block of upper memory (**Figure 1**). If this block is smaller than 38K, DriveSpace will have to load its driver into conventional memory.

FAQ #10 How do I start DriveSpace?

This is the easy part. First, if you're running Windows 3.1, quit all your programs and shut down Windows; you can't run DriveSpace while Windows 3.1 is running. Then type DRVSPACE at the command prompt.

After displaying a welcome screen, DriveSpace offers two modes of operation: express and custom. I recommend express mode. DriveSpace then displays a screen stating which drive it will compress and approximately how long that will take. This is your last chance to bail out; if you proceed, DriveSpace will begin the process of compressing your drive.

DriveSpace will reboot your computer several times as it compresses your data and will make any necessary changes to your CONFIG.SYS file. (AUTOEXEC.BAT isn't changed.) The entire process is automatic, so you can let it run unattended.

If you're using Win95, you don't have to exit Windows before starting DriveSpace. You can run the program from the Start menu by clicking on the Start button; selecting Programs\Accessories\System Tools; and clicking on DriveSpace.

FAQ #11 Can DriveSpace handle large disks?

DriveSpace can't create a compressed drive larger than 512MB. If your hard disk is bigger than 250MB, you may not set it up as a single compressed drive. (Remember, DriveSpace can more than double your disk capacity, so a 250MB drive can exceed the 512MB compressed-data limit.) Fortunately, DriveSpace lets you create more than one compressed drive on a single host drive. After compressing drive C, you can run DriveSpace again and create additional compressed drives. DriveSpace automatically assigns letters to these drives as you create them.

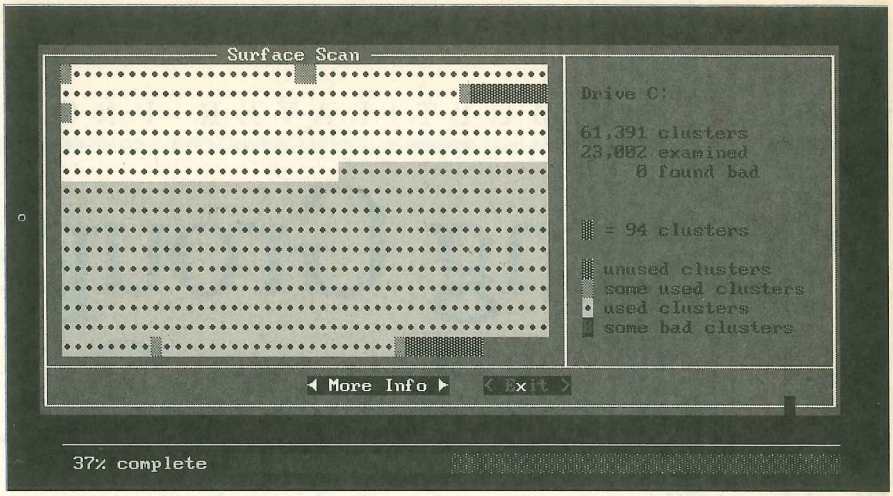


Figure 2. ScanDisk goes over your disk looking for damaged sectors that could interfere with the safe operation of DriveSpace.

FAQ #12 Should I be more conscientious about using Defrag and ScanDisk?

Yes and no. In the case of Defrag, a compressed drive is a bit more susceptible to fragmentation problems than an uncompressed drive. As a result, after compressing your hard disk run Defrag periodically to optimize the CVF. That can take a long time, so you might want to do it overnight. I defragment my compressed drives about once a month.

As for ScanDisk, the answer is no. DriveSpace runs ScanDisk when it compresses your drive, because some users have encountered problems caused by disk defects. After checking your disk, ScanDisk locks out any bad spots it finds so that your files can't use them (**Figure 2**).

Using DriveSpace doesn't make your computer any more or less likely to develop bad sectors. Because DriveSpace performs a quick check for cross-linked files and lost clusters whenever you start your computer, users who run DriveSpace don't need to run ScanDisk quite as often as those who don't use ScanDisk.

FAQ #13 Are there any other issues I need to know about?

Create an emergency floppy disk to ensure that you can access your compressed files if your hard disk refuses to boot:

1. Enter the command FORMAT /S to format a blank disk and make it bootable. This copies DOS's system files, IO.SYS and MSDOS.SYS, plus the driver program for DriveSpace, DRVSPACE.BIN, to the disk.
2. Copy your CONFIG.SYS and AUTOEXEC.BAT files to the disk.
3. Copy SCANDISK.EXE and DBLSPACE.EXE to the disk.
4. Also copy to the disk any other DOS or third-party utilities you might need in an emergency—for instance, FORMAT.COM, FDISK.EXE, and ATTRIB.EXE.

FAQ #14 Could I accidentally delete a compressed hard disk?

Not unless you're the type of user who likes to look for hidden system files, change their attributes, and then delete them just to see what happens. The CVF, the file containing all your data, is stored in the root directory of your host drive under the name DRVSPACE.000. If you have additional compressed drives, their CVFs are given names such as DRVSPACE.001, DRVSPACE.002, and so on. Leave 'em alone. Because they're hidden system files, you'd have to go out of your way to "accidentally" delete them. ■

CREATING MULTILAYER PROGRAM GROUPS

Nesting Groups In Windows 3.1

Would you like to nest group windows the same way Windows 95 users can? Here's how, using multiple copies of Program Manager.

by Robert L. Hummel

Perhaps Windows should have been named Drawers. If you took one glance at my desktop, you'd know why. My Program Manager resembles one of those desk drawers that are crammed with unreadable phone messages, short pencils, ticket stubs, and orphaned nuts and bolts—a real mess.

Drawers are handy catch-alls, but they make terrible models for computing environments.

Straighten Up

The main reason for most Windows 3.x chaos is that Program Manager won't let you nest groups within groups. You can put a group on your desktop, and programs in the group, and that's it. That's not the case in Windows 95, in which Microsoft has replaced the Program Manager interface with the Start menu, which lets you create many layers of groups. Any level of the menu can contain additional program groups, as well as programs and other items.

Do you have to upgrade to Windows 95 to be able to nest groups within groups? Not if you read this article. I'll show you a technique for nesting groups in Windows 3.x, thus adding a valuable tool for organizing your desktop. The trick is to create additional copies of the Program Manager program PROGMAN.EXE and then put them inside one another.

The accompanying screen shot (opposite) shows you an example of the results. The top left window is my original Program Manager. My copy of Program Manager appears as the Alternative Desktops program group.

Note that Alternative Desktops contains four icons, each representing a different copy of Program Manager. These new groups are open, each containing a single maximized program group.

What's the value of nesting copies of Program Manager? In my case, several people use my computer. Being able to create separate copies of Program Manager that each person can arrange and customize as he or she desires has improved our productivity and our attitudes.

But the technique can be just as useful if you're the only user, letting you hide groups of files you don't need and cleaning your desktop of its clutter.

Whether you choose to group your programs by function, customer, or user, I think you'll find this technique a great improvement to the Windows interface.

Group Therapy

To perform this trick, you'll need to make a few simple changes to Program Manager's executable file. You'll have to work in DOS, using the Debug program that comes with MS-DOS.

Don't let Debug scare you off; the entire process takes only a few simple steps. Even if you've never used DOS's Debug program before, you should have no problem.

And if you do mess something up, you can easily delete your mis-

take, leaving no permanent change to your system.

Let's get started. Your first step is to make a second copy of the Program Manager program file, PROGMAN.EXE. Change to the directory in which you have Windows installed—C:\WINDOWS on most systems. Then type the following command:

```
COPY PROGMAN.EXE PROGMN2.XXX
```

The original PROGMAN.EXE file uses the PROGMAN.INI file to keep track of its settings. To keep our new copy of Program Manager from conflicting with the original copy, we need to change the name of the file in which it will store its settings. We'll do that using Debug. Start Debug and load PROGMN2.XXX by typing the following:

```
DEBUG PROGMN2.XXX
```

Debug is simply an editor designed to work with binary files, including programs such as the Program Manager file we're working with here. Debug was written as a quick-and-dirty tool for programmers, so it uses a very cryptic syntax. The only indication you'll get that Debug is loaded and working is a hyphen prompt (-). Type the following command at the hyphen prompt:

```
-S Ø FFFF "PROGMAN.INI"
```

This command tells Debug to search PROGMN2.XXX for the text string PROGMAN.INI. Note that you must type the quotation marks and the string in uppercase exactly as shown. Also note the difference between the number zero used on the command line and the letter O that appears in the quoted string.

The Debug program responds to the above command by displaying the location in the file at which it finds the string:

```
1156:CBEA
```

Ignore the numbers to the left of the colon; they show where in memory Debug is loaded and will vary depending on your computer's configuration and the programs loaded.

The number to the right of the colon, which is in hexadecimal notation, is the item you're interested in: It's the location in the file where Debug found the string.

Next, type the letter E followed by the number representing the location of the string the Debug program returned in the previous step. In this example, the number is CBEA, so the command will look like this:

```
-E CBEA "PROGMN2.INI"
```

To confirm that the change has been made, type the letter D followed by the string location. Again, in the example we're outlining here, the location is CBEA:

```
-D CBEA
```

Debug displays that section of the file in two columns. Here's what the first two lines look like in this example:

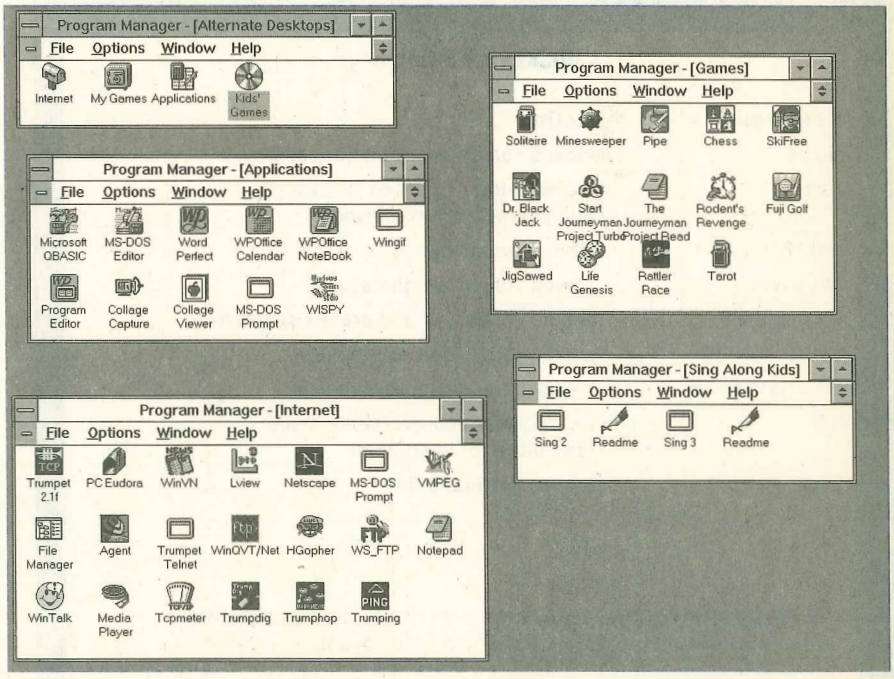
```
148B:CBEØ  5Ø 52 4F 47 4D 4E PROGMN
148B:CBFØ  32 2E 49 4E 49 Ø8 53
  65-74 74 69 6E 67 73 ØØ ØØ
  2.INI.Settings..
```

Ignore the hex numbers and look at the ASCII text on the right. You'll see that the name was changed correctly.

Now save the changes you've made by typing the letter W and pressing the Enter key.

Then type Q (for quit) and press the Enter key to exit DOS's Debug program and return to the DOS prompt.

Use the following command to rename PROGMN2.XXX :



A simple Debug trick puts copies of Program Manager within one another, thus letting you nest group windows a la Windows 95.

```
REN PROGMN2.XXX PROGMN2.EXE
```

Changes to PROGMAN and SYSTEM

You've now created a second copy of Program Manager. But before you can use it, you've got to make two more small changes to your Windows setup.

First, type in the following command, which lets you rename the original copy of Windows' Program Manager file:

```
REN PROGMAN.EXE PROGMAN1.EXE
```

Next, you'll have to make a change in your SYSTEM.INI file, located in the directory containing Windows. (On most computers, that's C:\WINDOWS). Using DOS's Edit program, open the SYSTEM.INI file and look for the [Boot] section. Find the Shell= statement and modify it to reflect the new Program Manager name:

```
Shell=PROGMAN1.EXE
```

Then save the modified file and exit the editor.

Opening Windows

Now it's time to use your new copy of Program Manager. Start Windows, and select New from the File menu. When the New Program Object dialog box appears, check Program Group and then click on OK. When the Program Group Properties dialog box appears, enter `Alternative Desktops` for the description and click on OK once more. Again, select File and then New. This time, check Program Item and click on OK.

In the description line, enter a label for the new copy of Program Manager. In the Command Line text box, enter this:

```
PROGMN2.EXE
```

Note that you can also click on the Change Icon button and select a new icon for your new copy of Program Manager.

Click on OK when you're done. Double-click on the icon to launch your new Windows 3.x Program Manager window and then set up one or more program groups as you would normally.

More for Your Money

You can create as many additional copies of Program Manager as you like. You must give each copy of the EXE file a unique name (PROGMN3, PROGMN4, PROGMN5 and so on) and edit it with Debug to create the matching INI filename.

Keep in mind that any name you choose must be exactly seven characters long. ■

DOS Tip

Speedy Editorial Services

In the days before DOS 5, editing the command line was a tedious business. If you could remember the keystrokes, you inevitably had to pause a second to find the right keys. These days, only three of those old keystrokes are worth remembering: backspace, Esc, and F3. The first one's a natural; when you notice a mistake, you can simply backspace to erase the error. To erase a command you've just typed, press the Esc key. To repeat the last command, press F3. If the cursor is right next to the DOS prompt, DOS displays the entire command. If you've moved the cursor to the right a few spaces, DOS copies the remaining characters from the preceding command line.

For more-involved editing tasks, you're better off relying on DOSKEY's more-intuitive keystrokes. (See the table below.) For instance, suppose that you've typed this command, using CS instead of CD:

```
CS C:\DOS\BACKUP
```

To quickly fix your mistake and execute the command, you can press Home, the right-arrow key, D, and End.

Of course, to make these keystrokes available, you have to execute DOSKEY. But that's a simple matter; just type `DOSKEY` at the DOS prompt.

DOSKEY's Editing Keys

Keystroke	Action
Home	moves cursor to left end of command
End	moves cursor to space following last character in command
right arrow	moves cursor right one space
left arrow	moves cursor left one space
backspace*	moves cursor left and erases character
Ctrl+left arrow	moves cursor one word to left
Ctrl+right arrow	moves cursor one word to right
Ins*	toggles between overstrike mode (default) and insert mode
Esc*	erases command line

* These two editing keys are always available at the command line; you don't need to execute DOSKEY to take advantage of them.

BATCH-FILE MEDIC

Will Your Batch Files Run Under Win95?

DOS 7 isn't completely compatible with earlier versions. Here are some of the problems you may encounter when running old batch files, plus solutions to help you adapt to the new operating system.

by Hardin Brothers

The history of DOS and batch files has been a gentle one. Each new version of the operating system has brought enhancements and additions to the batch language; each version has generally been compatible with the previous one. Usually, you could use your old batch files with no problem once you upgraded.

But Windows 95 and its underlying DOS have changed all that. Batch files are breaking left and right because this new DOS is only partially compatible with older versions.

This month, I'll take a look at some of the important changes and suggest ways to deal with them in your batch files. If you haven't yet upgraded to Windows 95, you'll either gain some hints about how to prepare for it or find some good reasons to stay with DOS 6.x and simply forget about the upgrade, at least for the time being.

Two for the Price of One

One of the problems with Win95's DOS is that it suffers from what a psychologist might call multiple-personality disorder. When you run DOS from within Windows 95, either full-screen or in a window, it has one mode of operation. If you run it before Windows 95 starts or by selecting Restart the Computer in MS-DOS Mode from the Win95 Shut Down menu, it's another beast entirely. It would help to have different names for these two modes of operation. For now, I'll call them DOS 95 (the version that runs within Windows 95) and DOS 7 (the version that runs when Windows 95 isn't loaded).

Of course, they're not really two different versions. It's just that DOS 95 has access to several of Windows 95's features, the most important of which, from a batch file's point of view, are long filenames, or LFNs. When Windows 95 is loaded, you can use a long filename with a DOS command wherever a traditional filename would work simply by enclosing it in quotation marks. For example, to delete a file called Report for 1995, you type:

```
DEL "Report for 1995"
```

You can, of course, use wildcards in long filenames just as you always have. Now *.TXT includes not only MYFILE.TXT but also "My Plea to the IRS to Stop Taxing Me So Much.TXT." Note, however, that when Windows 95 isn't loaded, there's no support in DOS for long filenames or any other special Windows 95 services.

It's important to discuss the long-filename issue because you conceivably can destroy data if you don't understand how LFNs work. In the traditional DOS file system, a directory entry contains 32 bytes, 11 of which are dedicated to the filename: eight characters plus an extension of three characters. Each active directory entry points to a new file.

In Win95's system, a file's primary directory entry is almost the same. Information about a single file (or subdirectory), however, can be stored in up to 22 consecutive directory entries. The first contains an 8-dot-3 name. (Windows 95 makes one up for every file except those you store with a traditional, uppercase 8.3 name.)

Up to 20 following directory entries store the file's long name, with 13 characters plus other information in each entry. Part of the reason that only 13 characters can be stored per 32-byte directory entry is that the name isn't stored in ASCII format but in Unicode, which allocates 2 bytes per character to make names compatible with alphabets other than our traditional English/Latin one.

In addition to the base directory entry and 20 long-filename entries, one other directory entry can be attached to the file to store class information about the file, which some applications can use.

When you're working in DOS 6.2, or even in DOS 7, long names aren't available at all and neither DOS nor utility programs can "see" the long names. If you move or copy a file with DOS 7 or earlier, only the 8.3 name is attached to the new file. (You can recognize these shortened names because the seventh character always contains a tilde.) You probably won't lose data because you've lost the long filename (although the 8.3 name Windows creates may confuse you and your applications).

However, you do lose any class information attached to the file. Class information will become more and more important as new Win95-specific applications appear; loss of class information could destroy the ability of some applications to work with your data.

To be safe, then, you should perform file operations or run low-level utilities such as disk defragmenters only from Win95 and DOS 95. Otherwise, you may lose data and destroy files and subdirectories.

New Commands

Long filenames are vital to Windows 95 and an essential part of DOS 95. But how do you deal with them in a batch file? DOS 95 gives you one new tool to make the task easier: an internal command called LFNFOR.

If you type LFNFOR at the DOS 95 prompt, you'll see the response:

```
LFNFOR is off
```

or

```
LFNFOR is on
```

You can change the state of LFNFOR with the commands:

```
LFNFOR OFF
```

or

```
LFNFOR ON
```

The LFNFOR setting affects how FOR...IN...DO commands, such as this one, produce filenames:

```
FOR %%F IN (*.EXE) DO ECHO %%F
```

If LFNFOR is off, this batch line will act just as it has in previous versions of DOS. It will produce a list of 8.3 names for every EXE program in the current directory. If LFNFOR is on, however, that line will produce a list of long filenames for the same programs. Some will be in mixed upper- and lowercase, some will contain spaces, and some will include symbols not permitted in 8.3 filenames.

Which is right? That depends on what your batch file needs to do. If you're updating DOS 6.x batch files to work with DOS 7, you'll probably want to turn LFNFOR off. If your batch files are working with 8.3 names, you may not want to confuse them with long filenames.

Windows 3.1 Tip: A Stitch in Time

If you run numerous programs at the same time under Windows 3.1, you'll encounter "Out of memory" messages unless you're careful. To keep such problems at bay, take these precautions:

- If you're using wallpaper, turn it off by opening Control Panel, double-clicking on the Desktop icon, and changing the Wallpaper setting to None.
- Get into the habit of minimizing applications you're not using at the moment.
- Choose File/Run, type SYSEDIT, and check out your CONFIG.SYS and AUTOEXEC.BAT files. Be sure they're loading DOS, device drivers such as ANSI.SYS, and memory-resident programs (TSRs) into the high-memory area (HMA). DOS's built-in memory manager will do this for you. To put it to work, exit Windows and type MEMMAKER at the DOS prompt.
- If you frequently use the Clipboard to store graphics or large chunks of text, clear the Clipboard when you no longer need the information stored there: Open Clipboard Viewer (usually in the Main group) and choose Edit/Delete. It's simpler, however, to highlight a single character and copy it to the Clipboard; Windows will copy that one character over the old information.
- Start your DOS applications before your Windows applications. Windows programs can set themselves up to run in less memory; DOS programs can't do that.
- Increase the size of your permanent swap file. To do that, choose Control Panel/386 Enhanced/Virtual Memory. Then click on the Change button and alter the appropriate settings.
- If you load several DOS applications, set up as many of them as possible to run only when they're in the foreground. To see the current settings for a DOS program's program-information file, start PIF Editor (in the Main group), choose File/Open, and load that file's PIF. Make sure that neither the Background nor the Exclusive box (in the Execution section) is checked.

A second set of new commands can help avoid conflicts between older DOS programs and the new Windows 95 operating system. Traditionally, DOS programs have been written under the assumption that they control the entire computer. For the most part, they can act that way with impunity because Windows 95 gives DOS programs an isolated part of the computer. But there's no way to isolate the disk-drive system for each program.

If you're running a program that will be confused if another program reads from or writes to the hard disk or, more importantly, creates or deletes files or directories, then you need a mechanism for turning off disk access for all other programs. The commands to do so are LOCK, which keeps other programs from writing to a disk volume, and UNLOCK, which restores disk access for all programs.

The confusing thing about LOCK and UNLOCK is trying to imagine which programs require them. Disk defragmenters and programs like ScanDisk do, but it's never safe to run low-level DOS 6.x utilities on a computer with DOS 7 installed. Even LOCK and UNLOCK don't help make such a program safe. But some DOS 6.x backup programs, and perhaps some DOS shells, will run better and more safely if you lock a disk drive before you run them and then unlock it when they're done. Otherwise, these programs may become confused if a directory changes unexpectedly.

The final new command, and one that should show up in many batch files, is START. To understand it, you first have to know that DOS 95 is more closely tied to Windows 95 than any earlier version of DOS and Windows. If you type the name of a Windows 95 EXE program at the DOS 95 command line, Windows will start that program and run it in the foreground.

The START command begins with that capability and expands on it. Not only can it start any executable program, it can also start any registered data-file type. For example, if you've set up Windows to run WordPad when you click on a DOC file, you can use the command:

```
START MYFILE.DOC
```

and WordPad will begin with MYFILE.DOC loaded. If you START a LNK file (which Windows uses to store shortcuts), the shortcut will be executed just as if you had double-clicked on its icon on the desktop or in Windows Explorer.

By using START's /M, /MAX, and /R options (which should precede the filename), you can tell Windows to start the program minimized (on the Taskbar), maximized to full screen, or "restored" (in its standard configuration).

If you use START to begin a DOS program, the program opens in a new DOS window, not in the one containing the START command. And if you use START /W plus a DOS program, the original DOS session—the one containing the START command—is suspended until the new DOS program ends. (The /W switch has no effect if you START a Windows program.)

The START command has several uses, but the most important one I've found so far is to automate the opening of several documents in different programs at one time. For example, I often need to start a specific Excel spreadsheet and a Word document together. A simple three-line batch file does the trick nicely:

```
@ECHO OFF
START "Job One.xls"
START "Job One.doc"
```

Changes in DOS

A couple of changes in DOS might drive some of your batch files batty. The first, and the one I'm saddest to see, is that the new DOS no longer supports the slash in FOR...IN...DO. Several batch files in this series have used this very powerful but undocumented feature of COMMAND.COM. But neither DOS 95 nor DOS 7 recognizes the slash as a string separator. Oh, well . . . .

The real question is how to parse strings now that the slash is gone. I've used the slash to implement arithmetic; divide a full filename into drive, path, and 8.3 base name; and perform a number of other tricks. There are ways to compensate for the missing slash, including using QBasic, which I'll explore in future articles.

A second problem your batch files may run into is that the DIR /B command, when it runs in DOS 95, produces long filenames instead of the short ones your batch file may be expecting. One way around this problem is to turn LFNFOR off and then use a FOR...IN...DO command to create a list of short filenames, like this (which assumes that you want to save the list in a file called DIRFILE.TXT):

```
IF EXIST DIRFILE.TXT DEL DIRFILE.TXT
LFNFOR OFF
FOR %F IN (*.*) DO ECHO %F >> DIRFILE.TXT
```

That's a bit longer than the old command:

```
DIR /B > DIRFILE.TXT
```

but it works just as well.

On the other hand, the long filenames generated by DIR /B aren't that difficult to work with as long as you remember to place them in quotation marks in your batch file. (You can place short filenames in quotation marks as well, so that your program doesn't have to distinguish between the two types of names.)

Long filenames can cause a problem in batch programs that expect a filename as a command-line parameter. If you expect a filename as the second of three parameters, for example, how do you handle a name such as:

```
Letter to Mom.doc
```

That looks like three parameters all by itself. A subtle change in the way batch files handle command-line parameters makes it easy. To understand the change, look at this simple batch file (which I've called SIMPLE.BAT):

```
@ECHO OFF
ECHO %1
ECHO %2
ECHO %3
```

Now assume that you issue the following DOS command:

```
SIMPLE "Letter to Mom.doc"
```

In DOS 6.x and earlier, SIMPLE.BAT's output would look like this:

```
"Letter
to
Mom.doc"
```

That is, each word appears as a separate command-line parameter. But in DOS 7 and DOS 95, the output looks like this:

```
"Letter to Mom.doc"
ECHO is OFF
ECHO is OFF
```

Everything inside the quotation marks, plus the quotation marks, becomes a single parameter. (The two lines that read ECHO IS OFF appear only because there's no second or third parameter available.) So handling long filenames should pose no difficulty for your batch files at all, as long as you remember to enclose those names in quotation marks. The real trick is remembering to put quotation marks around all filenames.

Other Small Differences

You should be aware of several other small changes in DOS 95. They probably won't break your DOS 6.x batch files, but you may find them handy for DOS 95-specific batch programs.

First, DOS 95 recognizes a slightly altered syntax for CD and CHDIR. You probably know that you can move to the parent of the current directory with this command:

```
CD ..
```

In DOS 95, but not in DOS 7, you can move up two directory levels:

```
CD ...
```

Each additional period moves up one more directory level. That's handier at the DOS prompt than it is within a batch file.

Second, if you ran a DOS prompt within Windows 3.1, one of the environment variables looked something like this:

```
windir=C:\WINDOWS
```

Testing that variable would have been a great way to determine whether your program was running under Windows. Unfortunately, because the variable name was in lowercase, there was no way to access or test it in a batch file.

In DOS 95, the same variable appears. But DOS 95 can access lowercase environment variables. Unless someone uses the command:

```
SET WINDIR=C:\WINDOWS
```

from the DOS 7 command line, your batch file can tell whether it's running in DOS 7 or DOS 95 mode with a line like this:

```
IF NOT !%WINDIR%==! GOTO DOS95Stuff
```

DOS 95 offers still another new feature, but I can't figure out how to use it intelligently. It sets an environment variable called CMDLINE with the last command line you've executed. At first, I thought CMDLINE would be useful for finding a batch file's own name.

CMDLINE is a little strange, though. It shows the command that started the last EXE or COM program, not internal commands such as DIR. Nor does it show the command used to start the current batch file or commands that resulted in a "Bad command or file name" error message. But it will show commands used to start an executable file from within a batch file. Is CMDLINE useful? If you find a good application for it, let me know.

Most of your batch files should run without too many problems in both DOS 95 and DOS 7. But before you entrust your computer to them, test them carefully. Change potentially dangerous DEL and COPY commands to ECHO DEL and ECHO COPY so that you can see what they're going to do. Then run them and analyze the results carefully. Once you're sure they'll work as you expect, feel free to use them just as you always have.

All in all, DOS 95's batch processing is enough like earlier versions of DOS that simple batch files should run without problem. Those of us who relied on the slash operator in FOR...IN...DO statements will miss it, sometimes very much. Other than that, once you get used to putting quotation marks around filenames, most of your batch files should work okay. And the new commands, especially START and LFNFOR, will make it much easier to develop batch files that will be useful both in DOS and in Windows 95. ■

SUMMING UP

- Use a long filename with a DOS command by enclosing it within quotation marks.
- A new command called LFNFOR lets you use either long or short filenames in a FOR...IN...DO command.
- A new command called START lets you run Windows programs and launch a program with a registered data-file type.
- The new DOS no longer supports the slash parser in FOR...IN...DO.
- The DIR /B command produces long filenames instead of short ones.

Listen to Your Keyboard

Thinking about replacing an unresponsive keyboard? Don't touch your wallet—KEYCLICK may solve your problem.

by Robert L. Hummel

Every day, thousands of computer users struggle to define the perfect system. They argue endlessly about monitor size, bus speed, and precisely how big a hard disk you need to be truly happy. It's a mystery to me why they consistently ignore what is arguably the most important part: the keyboard.

For all but the most perfunctory computer use, the keyboard remains your primary input device. Eye-popping graphics notwithstanding, it's still a text-based world. And to communicate with most software, write a letter, or create a program, you need to put fingers to keyboard and type—or peck.

Over the years, I've tortured myself with some of the worst keyboards ever manufactured. Typing was like crushing grapes with your fingertips—while wearing mittens. I prefer a keyboard whose keys have good travel, offer tactile feedback (a change in resistance that tells me I've pushed the key far enough to register the press), and make a quiet click when I press a key.

The cheap keyboards supplied with some of my computers are decidedly mushy and maddeningly mute. Of course, I could fix the problem easily by buying higher-quality keyboards, but I've taken a different—and cheaper—approach. I've compensated for the mushiness by programming the keys to click softly as I press them. They don't feel any better, but at least now I can hear what's going on.

Software Clicks

On a well-made keyboard, each key generates a mechanical click when you press or release it. On a cheap keyboard, a tiny, silent spring or plastic membrane may push phlegmatically back against your finger. No click. Adding a mechanical click is out of the question. But my memory-resident utility, KEYCLICK.COM, can achieve a similar effect.

KEYCLICK sits in memory and watches your keyboard. Each time you press certain keys, it turns your PC's speaker on and off once very fast, which produces a click.

Before you can use KEYCLICK, you have to create it. To convert the Debug script shown in the listing (page 56) to an executable program, follow the simple instructions in the "Debug Scripts" section of "How to Use This Magazine" (page 71 in this issue).

After creating the program from the Debug script, KEYCLICK.SCR, type KEYCLICK to load the program at the DOS command line. Or, to have KEYCLICK active during your entire DOS session, add the command to your AUTOEXEC.BAT file. KEYCLICK loads into memory and begins generating clicks for your keystrokes immediately.

KEYCLICK generates a click by sending commands to turn your PC's speaker fully on, then fully off, in quick succession—the electrical equivalent of slamming a door. Between these two commands, KEYCLICK pauses to generate a small delay. The duration of this delay determines how distinct and how loud the click sounds. To keep the program simple, KEYCLICK times the delay by counting to itself.

The speed at which KEYCLICK counts is determined both by your PC's processor type and its clock speed. Running the same version of KEYCLICK on two computers running at different speeds, for example, generates clicks that sound slightly different.

If you don't like the sound of KEYCLICK's click, you can change it somewhat. The click-delay count is specified in line 30 of KEYCLICK.SCR. As written, the instruction is MOV CX,0258. To create a new version of KEYCLICK with the desired delay, simply use your text editor to

KEYCLICK.SCR creates KEYCLICK.COM, a program that clicks your PC's speaker each time you press a key.

```
N KEYCLICK.COM
A 100
JMP   0148       ;Jump to initialization
PUSHF
PUSH  CX         ;Save used registers
PUSH  AX
IN    AL,60      ;Get scan code
TEST  AL,80      ;Skip if break code
JNZ   0140
CMP   AL,1D      ;Skip Left Ctrl
JZ    0140
CMP   AL,2A      ;Skip Left Shift
JZ    0140
CMP   AL,36      ;Skip Right Shift
JZ    0140
CMP   AL,38      ;Skip Left Alt
JZ    0140
CMP   AL,3A      ;Skip Caps Lock
JZ    0140
CMP   AL,45      ;Skip Num Lock
JZ    0140
CMP   AL,46      ;Skip Scroll Lock
JZ    0140
IN    AL,61      ;Read speaker control port
MOV   AH,AL      ; save settings
AND   AL,FE      ;Disable tone
OUT   61,AL
OR    AL,02      ;Turn on speaker
OUT   61,AL
MOV   CX,0258    ;Delay value
LOOP  0136       ;Count down
AND   AL,FD      ;Turn off speaker
OUT   61,AL
MOV   AL,AH      ;Restore previous setting
OUT   61,AL
POP   AX         ;Restore registers
POP   CX
POPF
JMP   0000:0000  ;Exit KEYCLICK
MOV   AX,[002C]  ;Get environment
MOV   ES,AX      ; in ES
MOV   AH,49      ;Release memory
INT   21         ; through DOS
MOV   AX,3509    ;Get Int 9 vector
INT   21         ; through DOS
MOV   [0144],BX  ;Save offset
MOV   [0146],ES  ; and segment
MOV   AX,2509    ;Set Int 9 vector
MOV   DX,0102    ; to our routine
INT   21         ; through DOS
MOV   DX,0148    ;Save us in memory
INT   27         ; through DOS

RCX
6B
W
Q
```

End

change the number in the KEYCLICK.SCR file and use Debug to recreate KEYCLICK.COM.

For a shorter or softer click, make the delay smaller. To extend the click and increase its volume, make the number larger. You'll find that the delay value shown in the listing is a good compromise for most PCs. For best results, keep the delay value between 1 and 1000.

Each time you press or release a key, the keyboard sends a stream of data to the keyboard controller. The controller verifies that the data was received without error, then translates the keyboard data into a unique, 8-bit value called a *scan code*.

Each key generates a unique scan code. By examining the scan codes, an application can distinguish between left and right Shift keys, for example. Most memory-resident programs use scan codes to watch for specific keys, and so does KEYCLICK.

After the keyboard controller determines a key's scan code, it generates a signal called a *hardware interrupt*. Interrupt (Int) 9, forces the system's microprocessor to stop whatever it's doing and immediately begin executing a subroutine in memory to process the keystroke.

When executed, the BIOS's routine for Int 9 retrieves the scan code from the keyboard controller. The Int 9 routine must then examine the scan code, check the status of the Caps Lock and Num Lock keys, and determine whether a you're pressing a Shift, Ctrl, or Alt key. Only when these tasks are complete can Int 9 translate the scan code into an ASCII value.

When KEYCLICK loads itself into memory, it intercepts Int 9, putting itself between the keyboard and the BIOS. Each time you press a key, KEYCLICK grabs control and gets the opportunity to examine the scan code. If KEYCLICK determines that releasing a key generated the scan code, it exits immediately and doesn't generate a click.

KEYCLICK then checks to see whether you pressed one of these keys: left or right Shift, left or right Alt, left or right Ctrl, Caps Lock, Num Lock, or Scroll Lock. If it determines that you pressed any of these keys, identified by its scan code, it exits immediately. These keys don't generate a click. (Otherwise, holding down the Shift key while hunting for other keys would generate a steady stream of clicks.) If you pressed none of these keys, KEYCLICK produces a click.

Hear, Hear

Silence is golden. But when your keyboard is silent, it can leave you wondering whether you pressed a key several times or not at all. With KEYCLICK, you can add a quiet click to even the mushiest keyboard and put the cost of a replacement keyboard toward your next PC. ■

SETTING UP A BULLETIN BOARD

To BBS or Not to BBS

Thinking about becoming an information provider? Despite all the hoopla surrounding the Internet, the good old-fashioned BBS still has many advantages.

by Beth Slick

You've seen it a thousand times in those old musicals: Mickey Rooney turns to Judy Garland and cries out, "I have an idea. Let's put on a show in the barn!" The shoestring production invariably grows into a multimillion-dollar MGM extravaganza with uniformed marching bands and a choreographed cast of thousands. All this to raise $200 to save the malt shop.

If you're thinking of starting a bulletin-board system, you're probably beginning with the same simple goals. Just throw some communications software on an old 386 PC, hook the machine up to a phone line, and wait for the world to knock on your electronic door. But if you're not careful, your modest Mickey-and-Judy show can quickly become an expensive and time-consuming spectacle.

Fortunately, with an estimated 80,000 to 100,000 BBSes alive and well, setting up and running a BBS is well-trod ground—and this article is your road map. With a little planning and soul searching, you'll be able to sidestep the pitfalls and have more fun putting on your show.

Do You Have What It Takes?

Hardware and money aside, the key to a successful BBS is whether you have the right tools—not only technically, but psychologically. Before you take the plunge, consider these issues:

- Are you dependable? A BBS is a long-term commitment. If you've got wanderlust, don't start a BBS. Users give up on a moving target.

- Will you be available to respond 24 hours a day, seven days a week, whenever your monster demands attention? If the system goes down, you'll lose your audience. Are you willing to give up your spare time to troubleshoot hardware, answer user comments and queries, pack the mail database regularly, and perform other maintenance duties? If you plan to turn your BBS into a business, you can expect to spend up to 60 hours a week keeping the BBS on its feet. "Running a BBS will take as much time as you're willing to give it," says Adam J. Viener, sysop (system operator) of the Cyberia BBS (717-848-1666; voice line 717-848-1439). "It's a virtual black hole of time consumption. We were lucky in that we turned our BBS into a career, but when I was running it as a hobby, it took so much time I almost forgot to stop and smell the roses."

- On the social side, do you have enough experience using electronic bulletin-board systems that you understand the rules and traditions of a cyber community? Use your behavior on those other systems to gauge your chances of success with your own system. Are you the life of the party? Helpful to others? Have you made friends on other systems who might follow you to a new BBS? If you answer no to these questions, you may find that attracting users is just about impossible—and more work than fun.

Aquila (708-820-8344) is one of the oldest bulletin-board systems in the United States.

• The sysop is also expected to be an electronic Henry Kissinger—someone who can handle all disputes with aplomb, keep troublemakers in check, and otherwise soothe hurt feelings. Are you psychologically suited to deal with these issues? Are you prepared to face those who, because they gave you $15 for a yearly subscription, believe they have a right to yell at you and that you're obligated to take it?

• Do you have a computer background? A sysop must be able to pop the top off the computer at a moment's notice, be comfortable reading manuals, and otherwise be a fearless and tireless troubleshooter. Additionally, asks Chris Reagan, manager of sysop education at Mustang Software, which makes the BBS program Wildcat, "Do you understand DOS and can you write a batch file? Even with Windows products, you have to understand batch files and PATH statements. If you don't, then don't set up a BBS."

Psychologically and technologically, the bottom line is that a BBS is like a garden. Occasionally you'll get roses or strawberries, but mostly you'll be planting bulbs and pulling weeds.

The Business Plan

According to Reagan, a business plan is important whether you're running a bulletin board as a hobby, for profit, or as a support center for your business. A business plan might sound like overkill if your BBS is just for fun. But if you don't have the resources, your bulletin board won't last long enough to achieve your goals.

Of course, you need a computer, a modem, and appropriate software. But don't forget your monthly phone bills: one for each telephone line. And although most of the calls will be incoming, remember that if you decide to exchange messages with other bulletin boards, you may find yourself calling all around the world to upload and download user e-mail.

A business plan is just a piece of paper unless you can stick to it. Can you resist the lure of expensive, gotta-have-it hardware, such as hook-ups to satellite feeds and CD-ROM towers?

As part of your plan, decide what revenue, if any, you expect. Will user fees pay for your system? Do you hope to make $100,000 a year? Don't expect much income when you first start out.

"Run your BBS for at least six months to establish a client base and prove you're stable," says Reagan, who was a sysop for six years before joining Mustang. Then start asking for donations."

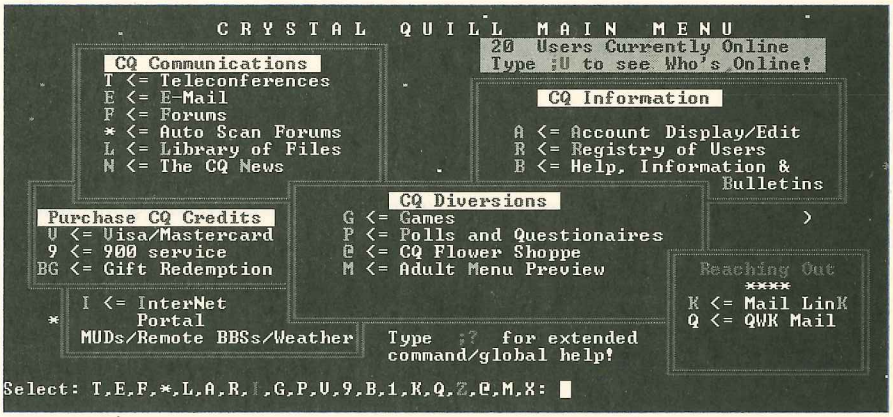
Even if your users are willing to pay, will you be able to get a merchant account from your bank so that you can take plastic?

The Association of Online Professionals sells a book titled *Business Planning for Online Services*, by David J. Kennedy. It includes sample BBS business plans, a shareware program called Business Plan Master, resources, tips, and ideas. The Association of Online Professionals is an excellent resource in itself; contact the group by phone at 703-924-9692 or via its BBS at 703-264-1750. The organization also maintains a Web site at **http://www.wdn.com/aop**.

Setting Up Your BBS

Most BBS software is DOS-based. That means you can run a two-line BBS on a 33MHz 386 with 4MB of RAM and a caching program.

Although faster is always better, inexpensive 386 and 486 models are plentiful, often costing less than $750. Consider a 100MB hard



Crystal Quill (703-241-7117) divides menu items into groups so that you can easily find what you're looking for.

drive as the minimum starting place for a small system—though unless you're getting a used computer, you'll find it difficult to find anything below that size anyway. When considering modems, spend your money on the fastest you can possibly afford. BBS software prices are usually based on the number of nodes, or incoming lines. Expect to pay about $150 for a two-line system. If you have your eye on a larger system, you'll find that the price per node decreases. A 32-node system may cost about $700.

Which BBS software you select is key to the features and benefits you can provide. During your own BBS travels, which did you prefer? Which ones were easiest to use? What's everyone else using and why? Ask around. Mustang's DOS-based BBS software Wildcat has the largest installed user base in the world.

"DOS is tried and true," Chris Reagan says. "Windows will be a powerful arena, but there will be a developer's learning curve. Third-party companies need time. Maybe in a year, a year and a half, Windows will become more dominant. But the fact remains that you can't beat DOS and DesqView."

Once you've decided on the software, you'll want to customize it, keeping in mind that you need to attract new users, not just please yourself. Keep it simple. Programmers usually believe ten options per screen is about all anyone can handle comfortably.

Once you've set up the look and feel of your system, be careful about making decisions that will change how the BBS works and what features you'll offer.

"Realize the emotional level of your callers," Adam Viener cautions. "People become addicted and very passionate about the BBS and how it's run. It becomes a very touchy subject when decisions are made that directly affect your callers."

Most important, strive to make your BBS unique. Find a niche, a vantage point—something that will make people curious. You won't have the biggest, been-around-the-longest, most award-winning BBS when you open your doors for business on day 1. In fact, you probably won't even have the first BBS in your area code. So what services will you offer to make it competitive? You have to be special.

The Marketing Advantage

If the next installment of *Star Wars* were playing at your movie theater, you'd know about it. For months in advance, the studio's publicity department would bombard you with interviews, behind-the-scenes stories, pictures, posters, and maybe even plush toys.

As a sysop, you, too, must think like a publicist. Once your system is stable and has a unique personality, you've got to get the word out. This is one area many sysops overlook completely. Whenever possible, let everyone know what's so special about you and your system.

Chris Reagan drummed up business for his BBS by teaching a class at the local YMCA on how to communicate on a BBS. Most of the attendees ended up being subscribers to his system.

The Association of Shareware Professionals (ASP) offers a BBS

BBS VS. INTERNET

The first fork in the road on your journey to becoming a system operator, or sysop, will be when you must decide: BBS or Internet? Does it make sense to invest in a BBS when the world is in an Internet/World Wide Web frenzy? Some are predicting that the Internet will do to BBSes what Godzilla did to Bambi in the animated classic *Bambi vs. Godzilla*: leave it behind as road kill.

BBS sysops agree that the Internet will have an impact on BBSes, but they part ways on how serious that impact will be. Tom Tcimpidis, sysop of the MOG-UR'S EMS BBS (818-366-1238), says the effect will be almost exclusively negative: "Local BBSes are disappearing at an ever-accelerating rate and are being replaced by 100-line monsters with full Internet access," he says. "My small [five-line] BBS is doing well, but that's primarily due to my extensive hands-on approach, something the big guys can't do or can't do well."

Others disagree. Bruce Donnally, who works in customer support at Broadway and Seymour, a company that sells software to the banking industry, says that his clients prefer BBSes because they're more reliable. "The BBS is never busy, [never has] a server problem, and it's quick," he says. "The Internet can be overloaded, and if your users are paying for your services, they demand quick-and-dirty access."

Chris Reagan is the manager of sysop education at Mustang Software, which makes the BBS program Wildcat. He agrees that BBSes have distinct advantages. "Because the Internet is so vast, you can't always find what you're looking for," he says. "The BBS is a place to go do something. Plus, you don't have the kinds of games [on the Internet that] you can find on BBSes." Reagan also says that it's far easier to strike up a chat, find a file, and even send a message on a BBS.

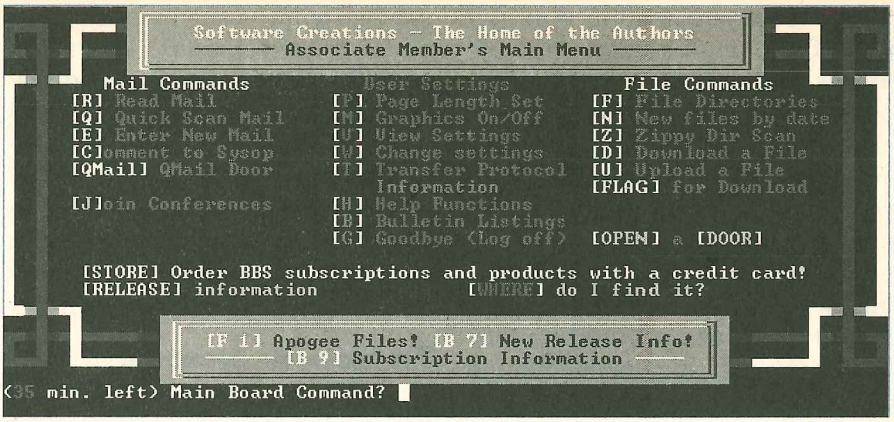
Which route you take depends largely on what services you want to provide. If you want to establish an intimate, special-interest community where users can exchange messages and enjoy on-line chat with one another, then the BBS is your choice.

On the other hand, if you just want to put your face into cyberspace, the easiest way is via a World Wide Web home page. Most of the commercial on-line services let users establish a home page at no extra cost.

Here's a third option you might want to consider: hooking your BBS to the Internet. That way, you can have your cake and eat it, too.

—B.S.

certification program, sort of a *Good Housekeeping* Seal of Approval. The group also provides a list of certified BBSes to the public. The ASP has a forum on CompuServe (**Go ASPFOR**) or you can call 616-788-5131 (voice line). For additional ideas, check out *Growing and Maintaining a Successful BBS*, by Alan D. Bryant (published by Addison-Wesley Corporate and Professional Services, 800-822-6339).



Software Creations (508-368-7139) is one of the top 100 BBSes in the country.

Legal Issues

A sysop's legal responsibilities are getting more complicated by the minute. You must be vigilant about maintaining the privacy of your users' messages, and you must watch for people posting illegal material, ranging from copyrighted works to pornography.

Horror stories also abound of equipment confiscated when illegal activities were planned via e-mail on the system of an unsuspecting sysop. As a service provider, your obligations vary widely, depending on your community and state. Check them out. A good place to start learning about these issues is the Electronic Frontier Foundation, a nonprofit civil-liberties group. See the EFF's Web site at **http://www.eff.org**; the voice number is 415-668-7171. The group also maintains a presence on major on-line services.

Another source is the monthly legal column in *Boardwatch* magazine, an all-around great resource for sysops. Contact its BBS at 303-973-4222. The subscription line (voice) is 800-933-6038; its Web site is **http://www.boardwatch.com**.

Still Thinking About Putting on a Show?

The actor Rod Steiger used to pose these two questions to struggling actors looking for career advice: "What would you do if you weren't successful as an actor? What job would you take?" Only budding thespians who couldn't conceive of a reply were encouraged to act; he told the others to go do that other thing. So if you're wondering why people put themselves through all those twists and turns to have a BBS, then maybe you shouldn't be a sysop. For the rest of you—on with the show! ■

DOS Tip

Trouble-Free Multidisk Copying

When you copy a directory full of files from your hard disk to a floppy disk, you run the risk of overflowing the floppy. If that happens, you'll have to figure out which files weren't copied and find a way to copy only those files to a second floppy disk. Luckily, you can avoid this trouble by using XCOPY and ATTRIB in concert.

For example, suppose that you want to copy the files in the directory C:\WP, including all files in subdirectories, to floppy disks in drive A. The first step is to set the archive attribute of all files in the directory and the subdirectories below it. The appropriate command is:

```
ATTRIB +A C\WP\*.* /S
```

The parameter +A sets the archive bit to copy files selectively. The switch /S tells DOS to include all subdirectories.

After setting all the source files' archive bits, you can repeat the following command until all files are transferred:

```
XCOPY C:\WP\*.* A: /S /E /M
```

Using /M ensures that each file is copied only once, because it tells XCOPY to copy only files whose archive bits are set. As with ATTRIB, /S tells DOS to act on all subdirectories below the existing directory; /E tells DOS to also copy any empty subdirectories. During the copy operation, XCOPY creates the necessary subdirectories on the target disk.

If the first floppy disks fills, you'll get an "Insufficient disk space" message, and XCOPY will stop. Remove the full disk and insert a new one. Press F3 to display the XCOPY command again and press Enter. Repeat this procedure until all files are copied. Because each file's archive bit is turned off after DOS copies it, DOS will make only one copy of each file.

Later on, if you need to restore files from the floppies to your hard disk, use XCOPY again. This command, for instance, would work for the example above:

```
XCOPY A:\*.* C:\WP\*.* /S /E
```

The Top 25 BBSes

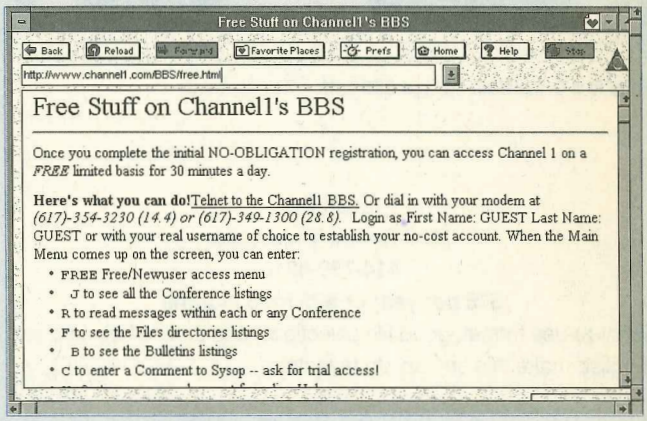
The Internet isn't your only choice for telecommuning with cyber-nature. BBSes have much to offer, including the personal touch of the resident sysop.

Find yourself with a frantic case of modem fever, but the major on-line services feel too big and intimidating? Try a computer bulletin-board system, or BBS—perhaps America's oldest on-line experience for personal-computing enthusiasts.

Computer enthusiasts run most of the U.S.'s 100,000-plus BBSes right from their own homes. One big factor in BBS appeal is that you can find just about everything the big guys offer, including chat services, huge file libraries, and Internet mail, often cheaper or for free.

We're going to give you a quick look at 25 BBSes we think rate among the best, based on their commercial success, features offered, or friendliness in presenting unique information. Understand, though, that choosing just 25 from a field so large is tough; many smaller BBSes have a lot to offer, as well.

Some of these systems are subscription based, but we've included a few free BBSes, too. To get a listing for your area code, check out Bob Breedlove's USBBS List, updated monthly, and available on many on-line services and BBSes.



The award-winning Channel 1 BBS also offers access through the Internet.

Beacon Studios BBS
Union City, New Jersey
201-863-5253
23 lines at 14.4kbps
$10 per month

This BBS includes free download areas for new users for an hour daily. Paid subscribers access more than 70,000 files on 14 CD-ROMs. Like many BBSes in this area, the atmosphere is pretty social. Beacon Studios offers games and boasts New Jersey's only WorldLink and ChatLink international chat connections each night. Internet e-mail, Usenet newsgroups, FidoNet.

Channel 1
Cambridge, Massachusetts
617-354-8873
140 lines at 57.6kbps
$60 per year

This service has been both commercial and popular since it made its debut in the latter half of the 1980s. Extensive on-line shareware and public-domain file collections for downloading, thousands of topical conferences, and user-friendly surroundings garnered this husband-and-wife success story a John C. Dvorak Award for Telecommunications Excellence.

Cyberia
York, Pennsylvania
717-840-1444
33 lines at 9600 bps or faster
subscription fee

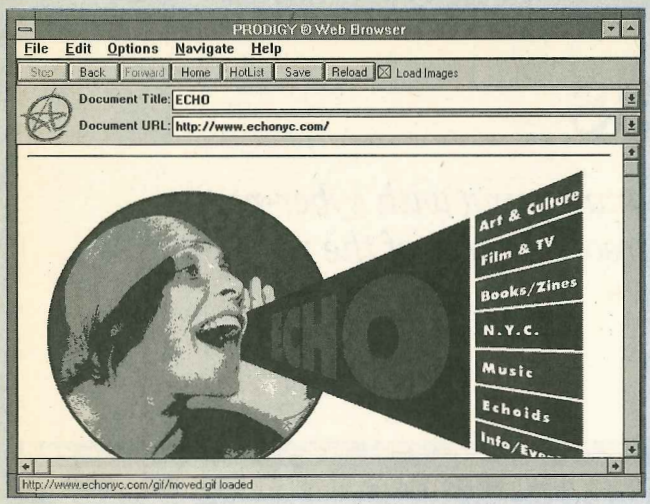
This board offers a good regional-information area.

The Doctor's Office
Vienna, Virginia
703-749-2860
50 lines at 14.4kbps
$0.30 per hour

Located in America Online's backyard, this popular Metro D.C.-area system features lots of downloads and on-line games.

Echo
New York, New York
212-989-8411
$19.95 30 hours per month
$1 each additional hour
$13.75 students and seniors

This system, located in Greenwich Village, offers a cozy, literate atmosphere. Founded by a group of women computer enthusiasts, it boasts a higher-than-average female participation. Internet.



Echo is a Greenwich Village BBS with a literary bent.

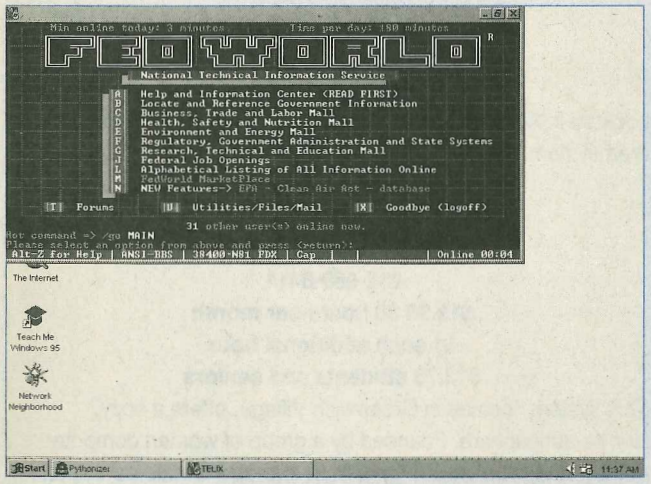
Exec-PC
New Berlin, Wisconsin
414-789-4210
$75 per year or $25 for 3 months

Easy-to-use format, good file selections, and on-line help in clear English make this one an old favorite.

Executive Network (ExecNet)
Mt. Vernon, New York
914-667-4567
20 lines at 38.4kbps
free

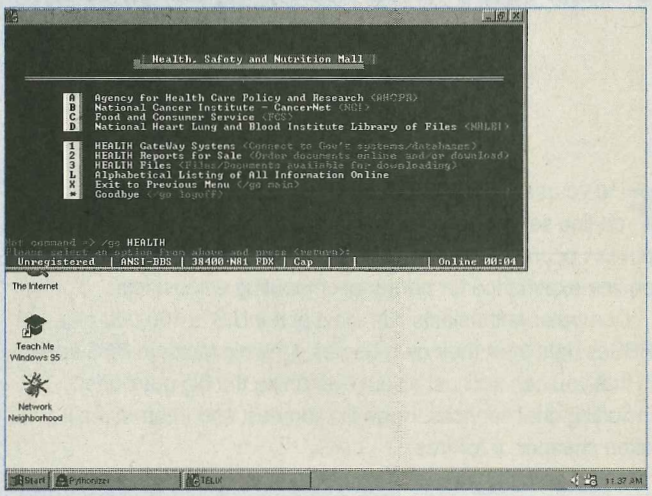
Access to 90,000-plus files and more than 6000 conferences. Internet.

FedWorld
Metro D.C.
703-321-8020
multiple lines at 14.4kbps
free (unless you count your taxes)



FedWorld is a repository of information from the U.S. government.

A government-information repository operated by the National Technical Information Service, a Congressional task force. You can find copies of past, current, and pending legislation, documents such as the Contract with America or the balanced-budget amendment, links to tax and consumer information. Also available via FTP at **ftp.fedworld.gov**.



FedWorld's health and nutrition document selections.

The File Bank Inc.
Denver, Colorado
303-534-4646
24 lines at 33.6kbps
$10 per month

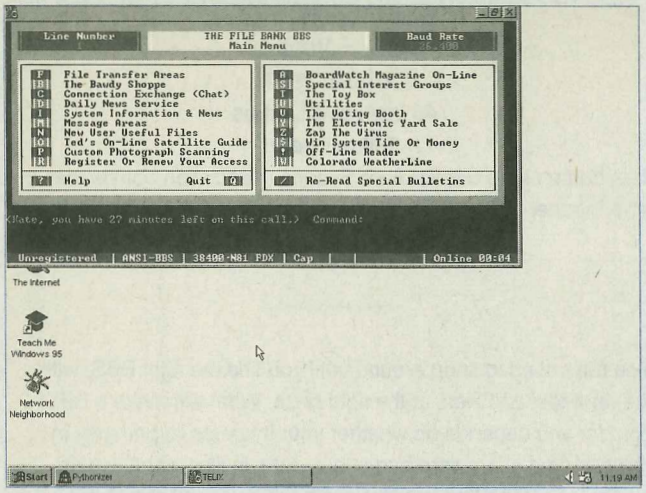
Specializing in astronomy, ham radio, and programming. Live chat and on-line games. More than 35GB of files and 500 conference areas. Several free download areas for visitors.

Freeware Hall of Fame
Charlottesville, Virginia
804-293-4710
1 line on a V.34 modem
free

Callers may download on their first visit. Beyond its well-stocked collection of DOS, Windows, and OS/2 files (no X-rated stuff), Hall of Fame includes doors for off-line mail reading, a vendor database, and more than 6000 technical-support boards.

The Golden Grotto
Fort Worth, Texas
817-790-2426
14 lines at 19.2kbps
$1 per hr

Check it out if you want to try some serious cyber-communications. Besides a decent file offering, the Grotto features games, WorldLink chat, on-line games, and a news service. Internet access includes SLIP, gopher, Archie, and FTP.



The File Bank offers everything from weather to an on-line satellite guide.

Hamptons Online
Southampton, New York
516-283-1114
28.8kbps
$7 per month; free trial

Part on-line service, part visitors bureau, part local ether-watering hole. Internet.

The Invention Factory
New York, New York
212-274-8110
46 lines
subscription fee

Sysop Michael Sussell offers 14GB of shareware and freeware. Internet, including Usenet newsgroups.

MicroSellar BBS
Verona, New Jersey
201-239-0001
51 lines up to 28.8kbps
subscription fee; trial access

Sizable library, games, access to various mail networks. Internet.

Midnight Driver Super Data Highway
New York, New York
212-750-3643
subscription fee; free net mail

The Highway is game-oriented; you'll find favorites from Apogee and ID here, along with a sizable CD-based library of files. Large base of Usenet newsgroups.

Network East
Rockville, Maryland
301-738-0000
26 lines at 14.4kbps
$30 per year

Offers federal job listings, Internet e-mail, more than 2000 global e-mail forums, more than 150 on-line programs, plus almost 15,000 programs for download. Internet host domain for e-mail to radio oldies program.

Nitelog BBS
Monterey, California
408-655-1096
45 lines at up to 57.6kbps
$25.95 per quarter

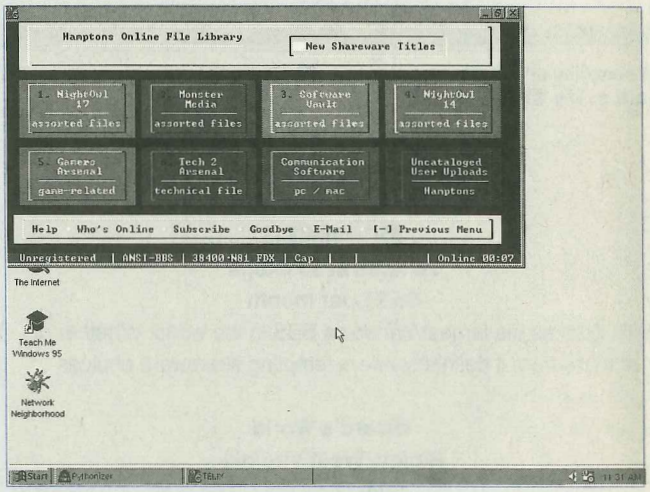
You'll find a large shareware base for DOS and Windows, plus lots of info-highway extras. Full Internet.

PCBoard
Cleveland, Ohio
216-381-3320
52 lines at 38.4kbps
$52 per year

Some 22 e-mail networks pass through here, along with more than 5000 conferences, plus hundreds of game doors and more than 100,000 files for downloading. Full Internet access.

The Power House
Trumbull, Connecticut
203-268-1275
4 lines at 57.6kbps
free

One of Connecticut's largest free systems, with 18 CD-ROMs of downloadable files, plus on-line games. Part of MajorNet network.



Hamptons Online provides a sampling of its services through download areas for nonsubscribers.

The Starship
Rutherford, New Jersey
201-935-1485
free

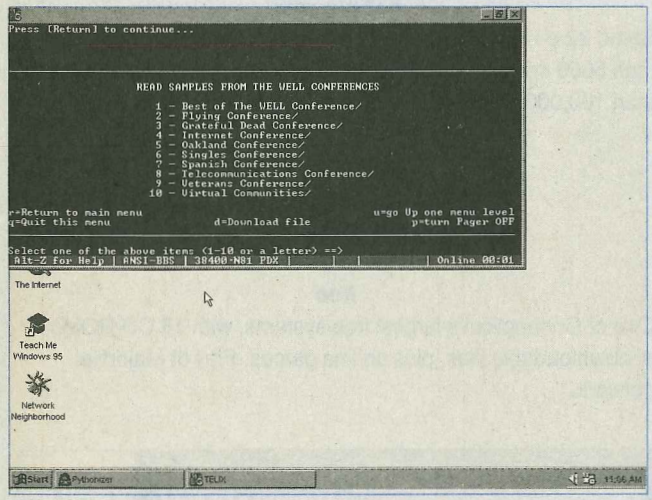
One of the older BBS systems, offering free public access, decent file libraries, a home to multi-BBS Global Chat Live, games, and varied discussion areas. Full Internet.

Strategic Telecommunication Systems
Sheboygan, Wisconsin
414-458-1451
20 lines at 38.4kbps
free

More than 30,000 files plus multiuser games. Internet.

The Whole Earth 'Lectronic Link (The WELL)
San Francisco, California
415-332-6106
$15 per month plus $2 per hour

Considered the *grande dame* of cyberculture virtual coffeehouses, with files, personalities, and more than 200 discussion areas.



A sampling of the offerings from The Whole Earth 'Lectronic Link (a.k.a. The WELL).

Windows OnLine
Danville, California
510-736-8343
26 lines at 33.6kbps
$5.95 per month

Bills itself as the largest Windows BBS in the world. Whether or not that's true, it definitely offers tempting shareware choices.

Wizard's World
Ripley, West Virginia
304-372-2163
two lines at 38.4kbps
free

This BBS not only has the entire FidoNet conference backbone on line, but a decent CD-based file collection and games, too.

World Data Network
Reston, Virginia
703-620-8900
40 lines at 28.8kbps
$40 per year

This home of the Capital Area Sysops Association boasts real-time Internet access.

You may need to shop around until you find the right BBS, with the right feel and files, at the right price. What will make a BBS right for you depends on whether your interests lie primarily in downloading shareware and public-domain files, chatting with others, or getting Internet features such as e-mail and newsgroups. Here's a quick checklist of how to evaluate a BBS on your first visit:

- Most BBSes provide bulletins informing you of the latest additions and special events or providing help using the system. If they're out of date, chances are the rest of the system is, too. Proceed cautiously or keep looking.
- Check to see whether the sysop indicates that he or she checks all new uploads for computer viruses before these files get released into public download areas.
- Is the system available when you want to call it? Some BBSes are so popular you can't get on them, while others operate in such a limited capacity than only one or two callers at a time can access the system.
- Find out whether the BBS supports off-line mail reading. You'll be able to read and respond to mail at your leisure and keep connect charges down.
- If you have children and the BBS offers sexually oriented material, ask the sysop whether there's a way to block access to adult discussion groups and explicit graphics files.
- If the BBS is a long-distance call, ask the sysop whether it's part of BBS Direct, a service providing call-in points in large U.S. cities through which you can contact any participating BBS. For more information, contact Concentric Network Corporation at 800-745-2747. If you have Internet access elsewhere, check whether you can reach the BBS via inbound telnet, FTP, or the World Wide Web.
- When you find a BBS you like, don't hesitate to ask the sysop questions, including what BBSes he or she likes to visit. You get great recommendations this way, as well as some terrific support.

—Kate Chase

RECOMMENDED BY OUR EDITORS

Super Software from DOS WORLD

Favorite Shareware Utilities Volume 2: Batch File Power Tools

Write Better Batch Files!!

Everybody loves batch files. These four powerful batch file shareware tools will help you create the Best Batch Files Ever! From fancy menus to cool colors to easy screen control, these Batch File Power Tools make YOU a batch file expert. Try them all for one low price!

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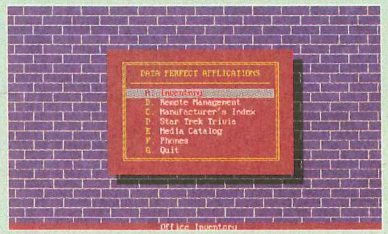
BATMNU 2.4. Create stunning menus! BATMNU make it fast and easy to create professional-looking menus for your batch files. Includes help screens, colorful backgrounds, headers and footers, mouse support, and even a screen saver!



GET 2.5. General purpose batch file enhancer. GET is small, requiring less than 6K of disk space, yet it contains nearly 30 batch file enhancements. Use it to capture keystrokes from users, check memory and disk space, control the screen display, determine printer status, and much, much more.

BTX 1.60. More great menu capabilities. Features include context sensitive help screens, full mouse support, on-screen date and time, control over margins, borders, and shadows, 43 and 50 line display support, special effects, and more. Simple menus require only a single line in your batch file.

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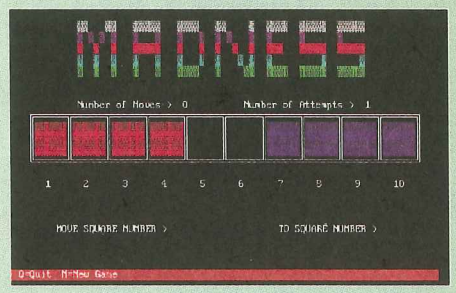

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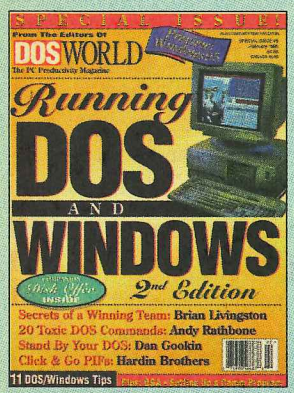

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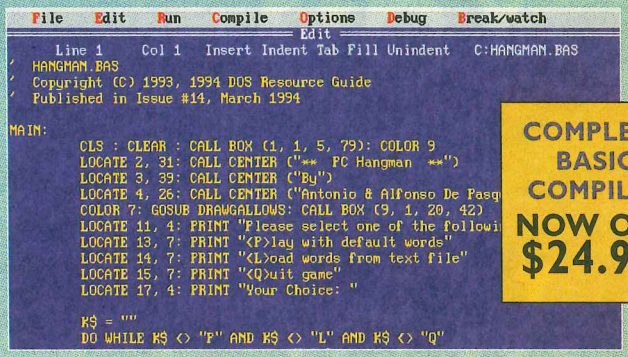

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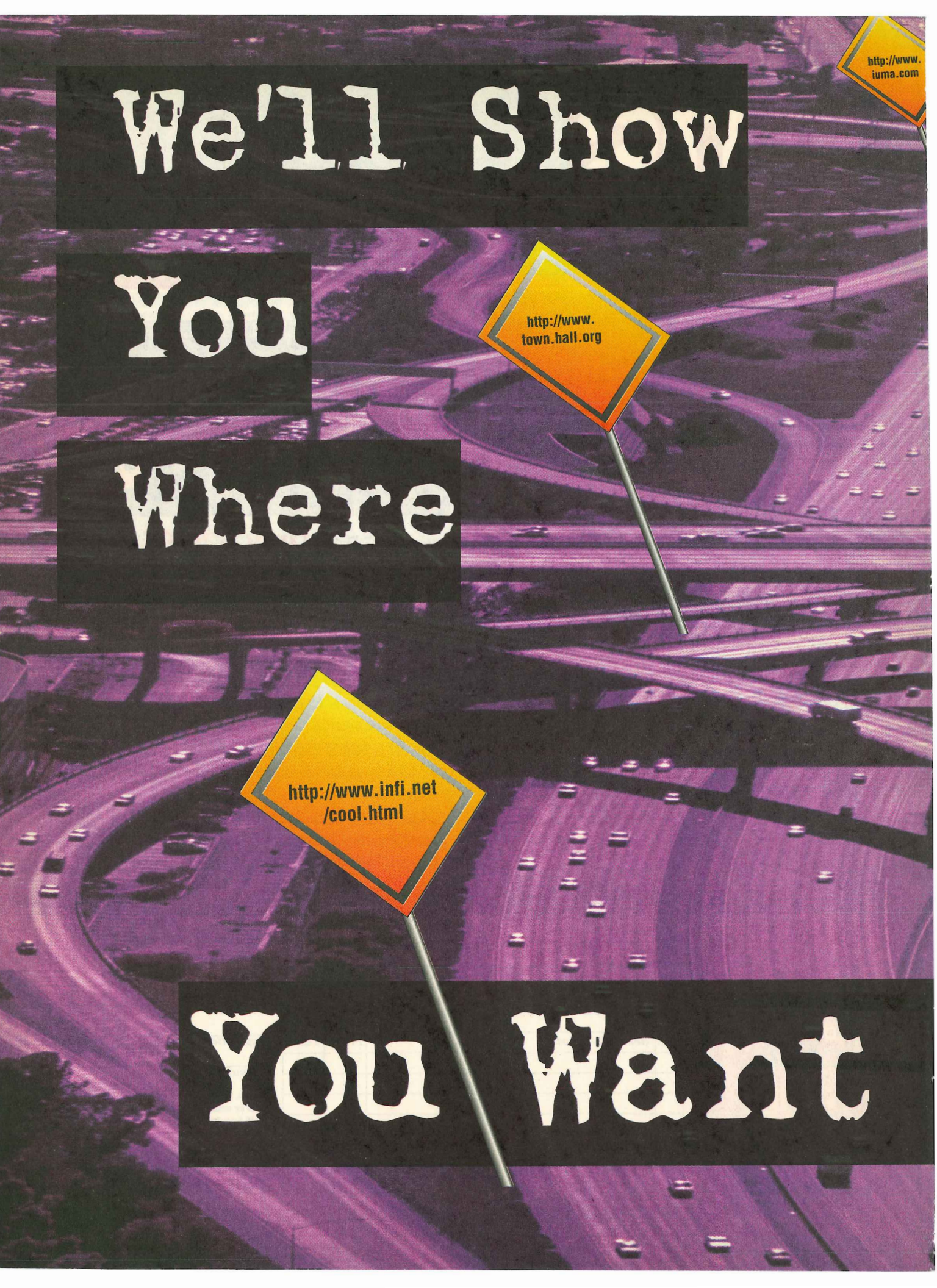
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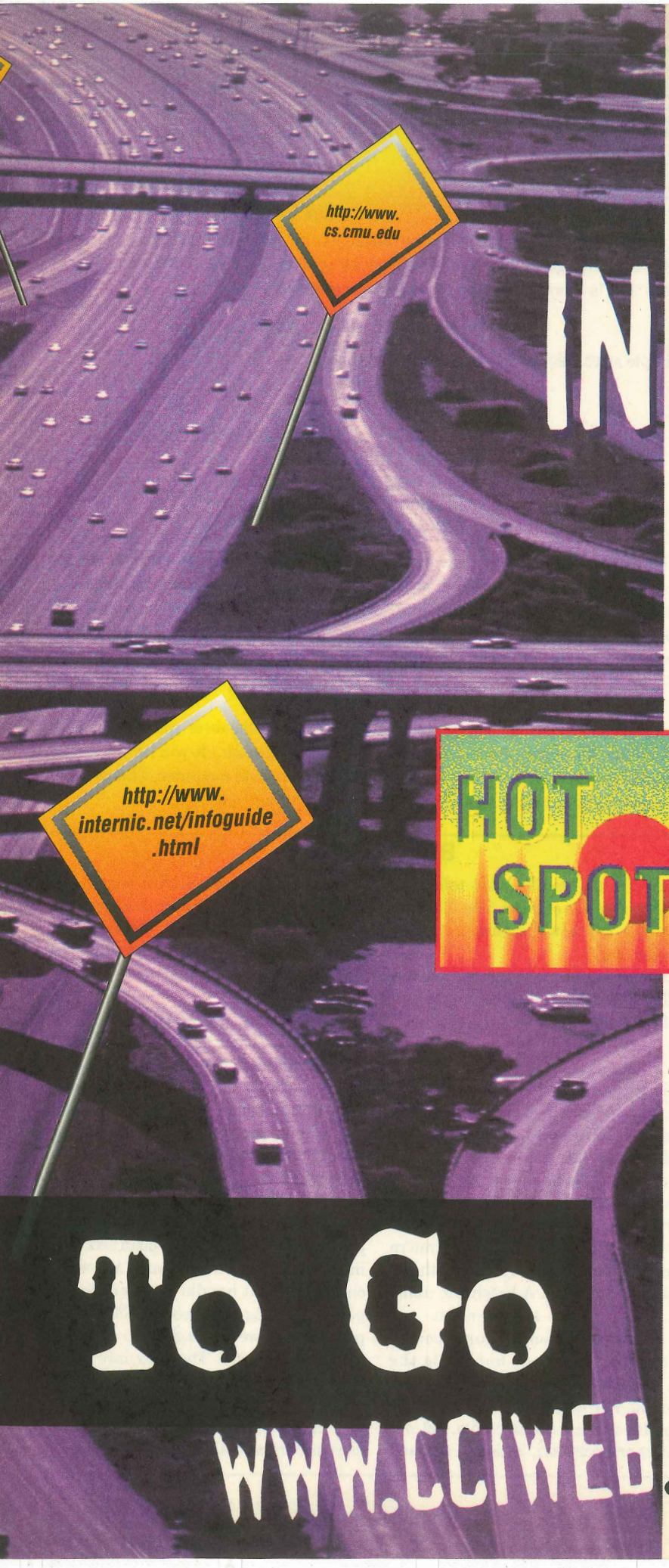

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How to Use

REPLACEABLE TEXT

Articles in DOS World will often give you a command that includes text you must replace with your own information. This replaceable text is in italics. For example, in the following command, you'd replace filename with the name of your own file:

COPY A:*filename* B:*filename*

THE CONFIG.SYS FILE

In your root directory is a file called CONFIG.SYS. Like AUTOEXEC.BAT, this file is in ASCII, and you can view your CONFIG.SYS file with the TYPE command. A typical CONFIG.SYS might look like this:

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS
DOS=HIGH,UMB
FILES=50
BUFFERS=10
SHELL=C:\DOS\COMMAND.COM
  C:\DOS\ /E:1024 /P
DEVICE=C:\DOS\ANSI.SYS
DEVICE=C:\DOS\SETVER.EXE
```

The rules for handling CONFIG.SYS are the same as they are for AUTOEXEC.BAT: Always back up the original file before you modify it and always have an emergency boot disk available. As with AUTOEXEC.BAT, changes you make to CONFIG.SYS won't take effect until you restart your computer.

ANSI.SYS AND THE ESCAPE CHARACTER

When an article says you must have ANSI.SYS installed, it means that the MS-DOS file ANSI.SYS should be in your \DOS directory, and the following line should be in your CONFIG.SYS file:

```
DEVICE=C:\DOS\ANSI.SYS
```

Some articles that discuss ANSI.SYS will also ask you to create a batch file that uses the escape character. Unfortunately, there's no uniform method of doing so. If you use EDIT, the text editor that comes with MS-DOS, you can make an escape character by pressing Ctrl+P and then the Esc key. The escape character appears on screen as a small left-pointing arrow. If you're using another text editor or word processor, check its instructions for information on how to enter the escape character.

THE AUTOEXEC. BAT FILE

Most people have a batch file called AUTOEXEC.BAT on their hard disks. If you want to look at it, first go to your root directory by typing CD\. Type DIR to make sure AUTOEXEC.BAT is there. Then type the following command:

```
TYPE AUTOEXEC.BAT | MORE
```

A simple AUTOEXEC.BAT file might look like this:

```
@ECHO OFF
PROMPT $P$G
PATH=C:\DOS;C:\WINDOWS;C:\WP51;C:\BAT
C:\DOS\SMARTDRV.EXE
C:\MOUSE\MOUSE.COM
C:\DOS\DOSKEY.COM
SET TEMP=C:\TEMP
```

When a *DOS World* article instructs you to modify your AUTOEXEC.BAT file, always make a backup copy of the original AUTOEXEC.BAT first. The most common names for your backup copy are AUTOEXEC.BAK or AUTOEXEC.BK. The latter lets you save different versions of your backups—for example, AUTOEXEC.BK1 and AUTOEXEC.BK2. You create a backup copy with the following command:

```
COPY AUTOEXEC.BAT AUTOEXEC.BAK
```

Also, you should have an emergency boot disk available whenever you modify AUTOEXEC.BAT. (See the accompanying section on the facing page, top.) It will let you access your hard drive in case you make an error that locks up your computer. Changes you make to AUTOEXEC.BAT won't take effect until you restart your computer.

BATCH FILES

A batch file is a text file that tells MS-DOS to do a series of tasks. The filename of a batch file always ends with the extension .BAT.

A batch file must be in plain-text format. For example, a batch file might consist of the following lines:

```
CD\
DIR /S /P
```

This batch file moves you to the root directory (CD\) and then gives you a list of all files in all directories (/S), pausing after each full screen (/P).

Every batch file needs a name. In such cases, you should pick your own name. Batch-file names carry the same limitations as any other DOS filename; you're limited to eight characters, plus a three-character extension. A batch-file name must always use the .BAT extension.

To avoid confusion and unexpected results, don't give any batch file the same name as another program or DOS command. For example, VCOPY.BAT is an acceptable name for a batch file, but not COPY.BAT or XCOPY.BAT, because COPY and XCOPY are the names of DOS commands. To run or execute a batch file, type its name at the DOS prompt. For example, to run a batch file called VCOPY.BAT, type VCOPY at the DOS prompt.

Creating and Saving

Using EDIT. If you have DOS 5 or later, you can create a batch file using EDIT. EDIT usually resides in your DOS directory. Type EDIT and enter your batch file. When you're done, press Alt+F and choose the Save option. Type the name of your batch file (make sure you add the extension .BAT) and press the Enter key.

Using other word processors. Most word processors don't save files in plain text; they include other characters, such as control characters that handle such matters as page formatting and typefaces. Most word processors, however, do give you an option to save in plain text. The procedure varies from one word processor to the next. For example, when you save a file in WordPerfect 5.1, you choose ASCII Text (DOS) as your Format option.

This Magazine

MAKING AN EMERGENCY BOOT DISK

Sometimes a DOS World article will suggest that you create a bootable floppy—a floppy disk that serves as an emergency system disk. That is, if your computer for some reason can't access your hard drive, you can start your computer from the emergency floppy. You should always have an emergency system disk available, but it's particularly important when you modify AUTOEXEC.BAT or CONFIG.SYS because you may change those files in such a way that your computer won't start from the hard drive. To create a system disk:

1. **Insert a floppy disk in drive A.**
2. **At the command line, type FORMAT A: /S (all existing information on the floppy will be lost).**

DOS first formats the floppy disk. Then it copies three DOS system files to the floppy disk: IO.SYS, MSDOS.SYS, and COMMAND.COM.

The first two are hidden files; you won't see them if you type DIR A:. If you have the disk-compression program DoubleSpace on your computer, the FORMAT command above will also copy DBLSPACE.BIN, a third hidden file, to the floppy disk.

After you've created your system disk, you should copy a few other basic files to your floppy. Go to your \DOS directory and copy the following files: FORMAT.COM, EDIT.COM, EDIT.HLP, QBASIC.EXE, UNDELETE.EXE, CHKDSK.EXE, FDISK.EXE, and SETUP.EXE.

DEBUG SCRIPTS

A Debug script is a list of assembly-language instructions you convert to an executable program using the program DEBUG.EXE in your \DOS directory.

Creating the script. A Debug script must be in plain text. The procedure for creating the script is the same as for creating a batch file. You can use DOS's EDIT program, or you can use a different text editor or word processor and save the script in plain text format.

Creating an executable program. After creating and saving the script, type the following command at the DOS prompt:

```
DEBUG < filename
```

where *filename* is the name of the Debug script you created. For example, if the name of your Debug script is KEYPRESS.SCR, you'd type this line:

```
DEBUG < KEYPRESS.SCR
```

at the DOS prompt. The executable program created by Debug will have the extension .COM. The name of the executable file is determined by the contents of the script. Our convention is to use the same name for the executable file as we do for the script. Thus, the executable file created by KEYPRESS.SCR will be named KEYPRESS.COM. Once you've created the executable file, you run it by typing its name at the DOS prompt. To run KEYPRESS.COM, type KEYPRESS.

PATHS AND THE PATH STATEMENT

DOS World articles often tell you to make sure that a particular file is in a directory included in your PATH statement. This lets you runs a .COM, .EXE, or .BAT file from any directory on any drive.

For example, an author might tell you to create a batch file called TEST.BAT, put it into a subdirectory called \BAT, and put the subdirectory into your PATH statement. You can then execute TEST.BAT by typing TEST from anywhere on your drives, without having to change to the \BAT directory first.

The PATH statement is a line in your AUTOEXEC.BAT file. It gives DOS a list of directories to search for requested files. Here's an example:

```
PATH=C:\DOS;C:\WINDOWS;C:\BAT
```

When you type TEST at the DOS prompt, DOS looks for the program first in the current directory, then in the root directory, and then, in order, the \DOS, \WINDOWS, and \BAT directories. When it finds TEST.BAT in the \BAT directory, it executes the batch file.

Continued on page 72

BASIC DEFINITIONS

DOS prompt. Also known as the *command prompt*. By default, the DOS prompt looks like this: C:\>. This is where you type the instructions to run programs or DOS commands.

Boot, boot up, reboot. The process of starting or restarting your computer. Turning on your computer is *booting* or *booting up*. Pressing the key combination Ctrl+Alt+Del restarts, or *reboots* your computer. So does pressing the reset button, if your computer has one.

Extensions. When we refer to a program by its common name (for example, the DOS command FORMAT) without an extension, you can assume that the extension is .COM or .EXE. When we refer to a batch file, we always include the extension .BAT. QBasic program names must always include the .BAS extension.

ASCII. American Standard Code for Information Interchange. For our purposes, an ASCII file is a plain text file, one that consists entirely of the characters you see on your keyboard.

Directories. Your hard drive has a main directory called the *root* or *home* directory. Directories created off the root directory are called *subdirectories*. When we provide the name of a subdirectory, it will look something like this: \WORD\FILES. Here, the root directory has a subdirectory called WORD, which in turn has a subdirectory called FILES.

File placement. We assume that the following files are in your root directory: AUTOEXEC.BAT, CONFIG.SYS, and COMMAND.COM. We also assume that your DOS files are in a DOS subdirectory, usually called \DOS.

Keystroke combinations. When you should hold down one key while pressing a second, we indicate it this way: Alt+F4 (press the Alt key and hold it down while you press the F4 key). When you should press one key, release it, and press another, we indicate it this way: Alt, F4 (press the Alt key, release it, then press the F4 key).

QBASIC PROGRAMS

QBasic is the programming language included in all versions of MS-DOS since version 5. The name of a QBasic program always ends with the extension .BAS.

Typing in the listing. Type QBASIC at the DOS prompt and press Enter to start. Now type in the listing as printed, pressing Enter at the end of each line. Note that when a line in the listing is indented two spaces from the line above and doesn't start with a command or keyword, it's a continuation of the previous line. Other indentations, or none at all, indicate a new line.

Subroutines and functions. QBasic listings often include subroutines and functions, and typing them is confusing at first. They begin with a line containing the keyword SUB or FUNCTION. Note that when you type a SUB or FUNCTION line and press Enter, all other lines you've typed will disappear from view. This can be disconcerting for beginning programmers. There's nothing to worry about—your listing is safe. To avoid screen clutter, QBasic simply hides other parts of your listing when you're typing in a subroutine or function. To see the other parts of your program, open the View menu at the top of the QBasic screen, then select SUBS. The SUBS dialog box will appear, letting you select the part of the program listing you want to view.

Saving a listing. Save your partially completed listing as you go along, rather than waiting until you've typed in the whole thing. To save, open the File menu, choose Save, and type in a filename when QBasic prompts you. We suggest using the filename specified in the magazine article. Subsequent saves of your listing won't prompt you for a filename, but will instead use the filename indicated the last time you saved the listing.

Running a program. After you've typed in the entire listing and saved it a final time, you can run the program by selecting Start from the Run menu or pressing Shift+F5. If QBasic finds an error, it will stop the program and highlight that line. To run a QBasic program (a .BAS file) stored on your hard drive, start QBasic, then select Open from the File menu. Choose from among the .BAS files displayed in the open dialog box to load the program into QBasic, then select Start from the Run menu or press Shift+F5. To stop a QBasic program, press Ctrl+Break; select Exit from the File menu to return to DOS.

***DOS World* BBS.** Typing and debugging a long listing is time-consuming. If you have a modem, our listings are always available on *DOS World*'s bulletin-board system (BBS) at 603-924-3181. There are no connect-time charges; you pay only for the phone call. Set your communication program to 8 data bits, no parity, 1 stop bit (8, N, 1). Dial the number and wait for the "Connect" message. If you're a first-time user, the system will ask you to enter your name and choose a password. Then it will display a general information screen, followed by a questionnaire requesting your address, phone number, and so on, so that we may set up your account. From this point, on-screen prompts are the same for all users. A series of messages present the latest BBS news; press Enter after each message to go to the next screen. From the Bulletin Menu, Bulletin #1 offers information on navigating the Main and File Menus, with instructions for listing, marking, searching for, and downloading files. ■

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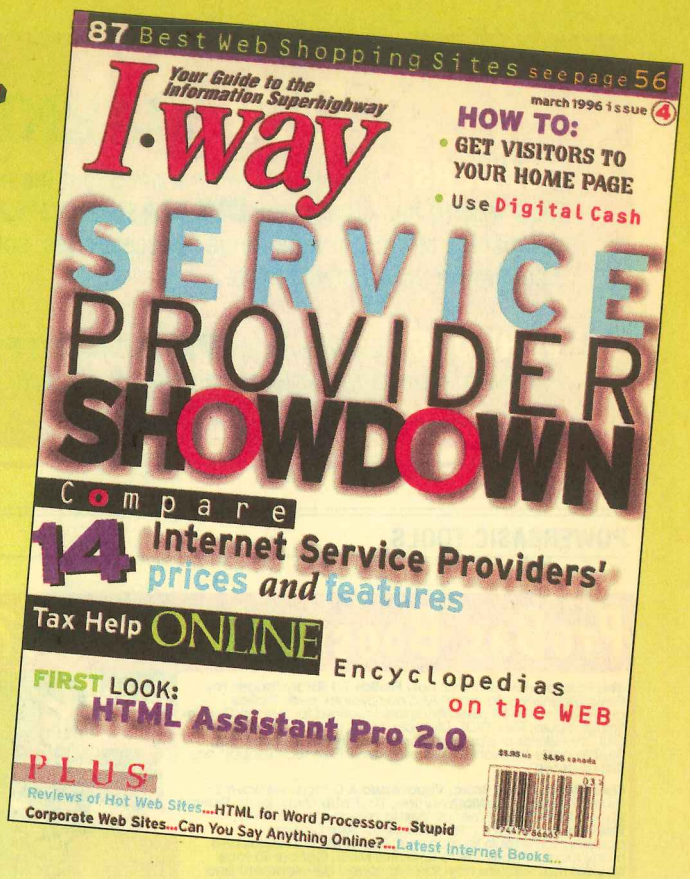

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DW MARKETPLACE

READERS: To help you learn more about the many interesting products available for your PC, **DOS World** has created the **DW MARKETPLACE**. This special section makes it easy to contact companies offering a wide range of accessories, software, and services. Listings are grouped by product category for your convenience.

VENDORS: Listings in the **DW MARKETPLACE** are sold by the column inch.
For more information or to place your ad, contact Linda Guyette at ***800-343-0728*** *or* ***603-924-7271.***

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Windows 95 comes with many accessories, but computer users always want more. It's fun to try out new programs and to spruce up the appearance of your desktop. Plus there are some handy programs that Windows 95 really should have included from the start.

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You'll find something for everyone. You get three jam-packed diskettes full of programs, games, and graphics for your computer.

*plus $1.95 for shipping and handling. To utilize all of the Accessory Pak programs, you must have Windows 95.

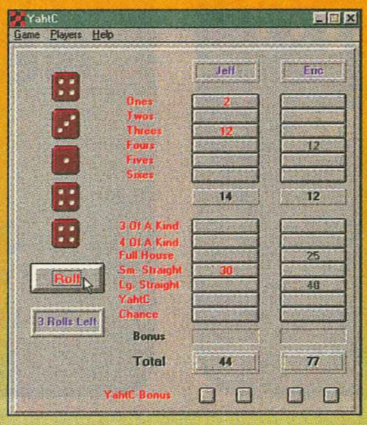
BusinessCards. This address book lets you keep track of names, addresses, phone numbers, and other information. Everything is just a click away. You also get **BusinessDialer**, which uses your modem to automatically dial phone numbers stored in BusinessCards.

VistaCalc. Windows needs a simple, easy-to-use spreadsheet, and this is it! VistaCalc gives you all the basic spreadsheet functions. Whether you're making a family budget or a company financial plan, VistaCalc can do the job. It's truly "user friendly."

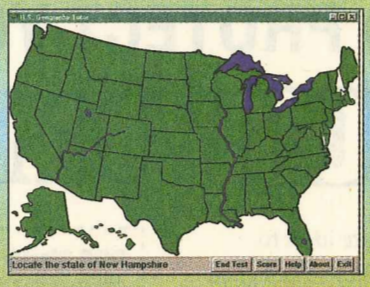
MaxIcon. Icons are everywhere in Windows, but did you know you can make your *own* icons? You can do that and more with MaxIcon, the icon editor for Windows. Create your own icons or modify existing ones; then assign your custom icons to programs and files. It's fun and easy with MaxIcon.

Kaleidoscope. Watch stunning geometric color patterns emerge as Windows goes to sleep. This colorful screen saver even synchronizes itself to the music you play on your computer's CD player. It's captivating.

Scrabout. Based on everyone's favorite word game, Scrabout lets you play against up to three opponents to see who can make the greatest number words by placing letter tiles on the game board. Increase your word power by playing against the computer, human opponents, or a mix of both.



YahtC is a multiplayer dice game.



U.S. Geography Tutor helps young and old improve their knowledge.

Kaleidoscope is a mesmerizing screen saver.

WAXMAN. Play chess against the computer with WAXMAN, the pocket chess game for Windows. The program features an "easy" mode and a variety of settings, so that you can tailor WAXMAN to your skill level.

U.S. Geography Tutor. This geography teaching and testing program displays a map of the United States, then asks a series of questions. Students (and their parents!) respond by clicking with the mouse cursor on the correct spot on the map. The program keeps score and lets you monitor your progress.

YahtC. Players roll five dice up to three times to produce scoring combinations. Go for three or four of a kind, a full house, large and small straights, and so on. Combine luck and strategy to achieve a high score. Fun for both kids and adults.

Graphics. The Accessory Pak also includes a variety of graphics files you can use as wallpaper to add pizzazz to your Windows 95 desktop.

PDGR/MAX/DW27AP

Most of the programs in the Accessory Pak are shareware programs. Shareware is "try before you buy" software. The programs are made available to you for evaluation at a small fraction of their retail prices. You may evaluate each program in the Accessory Pak for a specified period of time. Then, if you decide to continue using the program, you are required to contact the vendor and pay a fee to become a registered owner of the program. We wish to thank the program vendors for their generosity in letting us make this software collection available for your evaluation.

PC Resources

News and reviews of DOS and Windows enhancements, upgrades, and products

Edited by Steven F. Smith

Plug and Play And See

MAG InnoVision is introducing a series of high-performance Plug and Play color monitors (2801 South Yale Street, Santa Ana, CA 92704, 714-751-2008), designed to support Windows 95 and the new VESA communication standard for Display Data Channel, which lets the monitor communicate directly with the video card. This standard reduces configuration time and produces ideal setup resolutions and refresh rates.

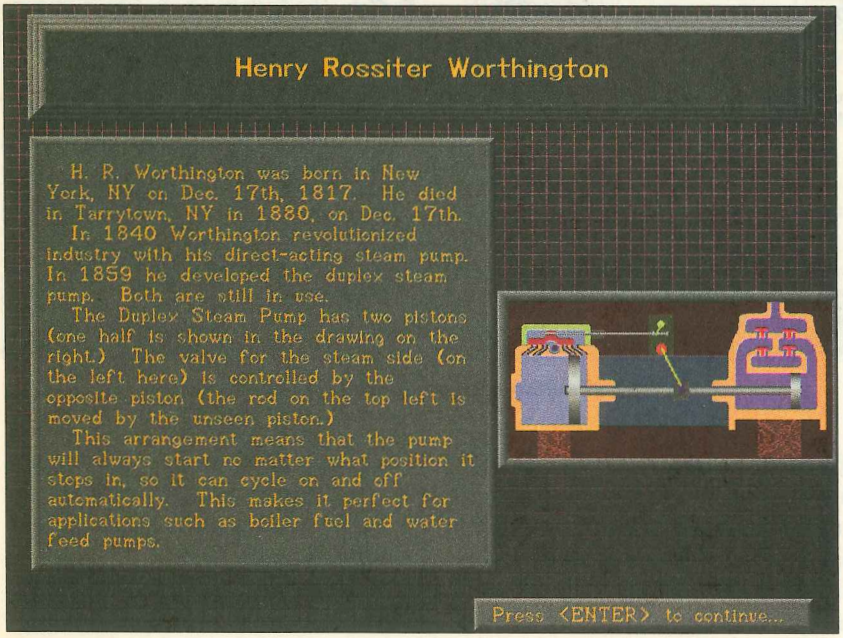
The 15-inch **DX15T** ($499) and 17-inch **DX17T** ($899) feature MAG InnoVision's "Advanced Technitron" flat display surface with ultra-high resolution and refresh rates of up to 75Hz at 1024 by 768. In addition, "pin-cushion" control lets you adjust distortion, eliminating the bowing effect of vertical lines along the sides of the display.

MAG InnoVision's 17-inch DX17T monitor offers high resolution plus Windows 95 Plug and Play capability.

Pump Up The Video

All About Pumps (Animated Software Company, $59.95; P.O. Box 188006, Carlsbad, CA 92009, 800-551-2726) is for anyone fascinated with how gadgets and things mechanical work, and anyone who wants to understand vital areas of home and automobile repair.

This totally DOS CD-ROM illustrates more than 50 types of pumps for home and industry, how and where they're used, how they work, and their historical background. All About Pumps transcends the home-handyman genre by presenting a primer in basic physics that will benefit high-school and college students.



You can find anything and everything you'd ever want to know about pumps and how they work on the all-DOS CD-ROM All About Pumps.

As a multimedia tool, All About Pumps goes all-out with colorful animation techniques, combining Disney-like frame-to-frame hand drawing with advanced assembly-language playback techniques. All other information is text-based (no audio), with printed material accompanying each inset animation. You won't need documentation; you can easily find your way around by pressing the F10, F5, and Enter keys, plus a simple Alt+Q combo to quit.

The software requires no hard-disk space; all you need is any PC with 512K of available RAM, MS-DOS 2.1 or later, 1MB of video RAM, 2.7MB of EMS or XMS, a CD-ROM player, and a color monitor. You can use a mouse for some tasks, but a keyboard is essential. Installation is as easy as loading the disc and typing `GO` at the drive prompt. If you don't like it or it won't run on your PC, you can return All About Pumps for a complete refund.

Continued on page 78

Smooth Scrolling Ahead

While some DOS text editors scroll in one-line increments, **Smooth Editor** (Dubbeldam Software, $20 registration fee; Julianalaan 36, 2628 BH Delft, Netherlands; **100554.1102@compuserve.com**) uses a smooth-scrolling technique found in many computer games. Smooth Editor's technology increases scrolling speed, for faster and easier file editing.

This DOS-based shareware program has a Windows-like interface, and offers drag-and-drop features so that you can transfer text to the Windows Clipboard for cutting and pasting. For example, you can copy a section of DOS text with Smooth Editor and paste it into your favorite Windows word processor. The program also features macros, multilevel undo and redo, customized scrolling and colors, bookmarks, and word wrap.

Smooth Editor requires a 386 PC or greater with VGA video card. You can download the program via most commercial on-line and bulletin-board services, under SMED20.ZIP and SMED20.ARJ. Use the program free for 30 days; then pay a $20 registration fee.

Just What You Need

No matter how old your DOS-based system is, **SoftAware 1.0** (SoftAware, $69.95; P.O. Box 868126, Plano, TX 75086, 214-596-3713) can help you choose application software that's just right for your PC. Designed to eliminate much of the guesswork associated with software/hardware compatibility, SoftAware examines your system and compares it with the information in its extensive software database.

The package also includes a screen saver, a file manager containing nearly a dozen file and disk utilities, and a text editor. System requirements are an 8088 PC or greater, DOS 3.x or later, one floppy drive, 3MB of available hard-disk space, and a monochrome monitor.

A Job You Can Love

Looking for a career that pays? **Adams JobBank** (Adams New Media, $49.99; 260 Center Street, Holbrook, MA 02343, 617-767-8100) gives you a jump-start on the competition in landing that new opportunity.

With JobBank's extensive data collection, you get easy access to relevant background information on major employers, which will help you craft a targeted résumé and cover letter and prepare for an interview.

Adams JobBank's video and audio simulate real job interviews.

Adams JobBank, for Windows 3.1, is the result of 15 years of research into more than 15,000 major U.S. firms and organizations. (Accordingly, it requires 45MB of hard-disk space.) But if you're serious about moving up the corporate ladder, you'll find more than 13,000 employer profiles, the vital details behind more than 2200 executive-search firms and employment agencies, more than 1900 job lines with prerecorded career listings and descriptions, plus 300 profiles of America's fastest-growing firms.

Available on either 3.5-inch high-density floppies or 5.25-inch floppies, JobBank requires a 486 PC or greater, DOS 3.1 or later, Win3.1 or Windows for Workgroups, 4MB of RAM, 45MB of hard-disk space, mouse, and modem; a sound card is optional.

Staying on Track

Whether you work at home or use DOS at the office, **1st Track** (Ageless Software Company, $99.95; 10737 San Diego Mission Road, #212, San Diego, CA 92108, 800-208-1023) can help you control and market your business efficiently. Designed especially for managers, attorneys, dentists, bookkeepers, and consultants, 1st Track is entirely DOS with a Windows-like interface (pull-down menus, button bars, dialog boxes, and so on). It can help you organize a client list, keep a calendar of events, track demographics, handle inventory, and more.

The program includes built-in templates for common management tasks, or you can design your own. Drop-down paste lists and drop-down duplicate lists let you input previously entered data with a single keystroke or mouse click. 1st Track's main screen consists of three related windows: Category, Template, and Records. You don't need to open or close a file, because that happens automatically when you choose your desired category and template. From the Record window, add or view an entire record, or quickly print mailing labels and reports, do a mail merge, or dial the phone through your modem.

System requirements are a 286 PC or greater with 1MB of RAM and 1MB of available hard-disk space. 1st Track supports both color and monochrome monitors. A mouse is optional.

Give It the Ol' Boot

According to the National Computer Security Association, 70 percent of reported computer viruses are boot-related. Because boot viruses kick in before most antivirus software can activate, many of these bugs prove elusive; only expert PC users dare try to remove them.

But **BootShield**, a new companion solution for VirusScan (McAfee Software, $35; 2710 Walsh Avenue, Santa Clara, CA 95051-0963, 408-988-3832) provides instant protection from boot viruses, masking your PC's boot images and identifying changes associated with this type of virus. Once these changes are identified, BootShield lets you remove the virus with one keystroke.

You can install BootShield on DOS, Windows 3.x, Windows NT, and Windows 95 systems. The software contains several modules, including BootLock monitoring technology; Scan, which detects boot viruses before BootLock activates; and ImagStor, McAfee's image-backup utility for disaster recovery.

STOP MOUSING AROUND

Got a desktop burn on your wrist from sliding your mouse back and forth all day? You can rest that hand and still move around your screen fast and easily with Interlink Electronics' new **DeskStick** ($59.95; 546 Flynn Road, Camarillo, CA 93012, 805-484-8855), a joystick-like pointing device that rests in the palm of your hand.

To move your cursor, simply extend your index finger to DeskStick's fingertip joystick. Interlink's Force Sensing Resistor converts changes in pressure—the touch of a thumb—to changes in resistance, which it then translates into cursor movement. Use your thumb or little finger to tap or click buttons for easy item selection and click-and-drag. Designed for either the left or right hand, DeskStick is compatible with any standard Microsoft-style mouse for DOS, Windows 3.x, or Windows 95.

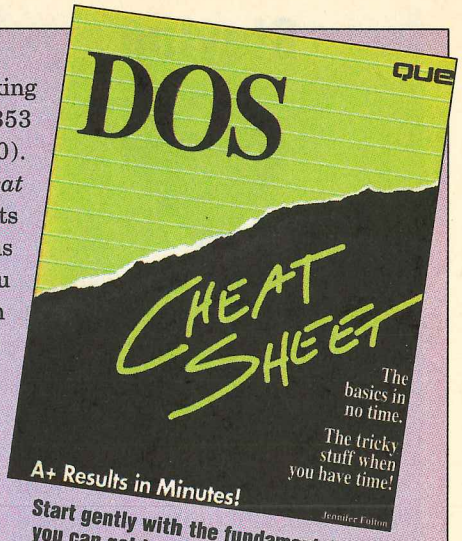
Continued on page 80

Let your fingers do the walking, and give your wrist a rest, with DeskStick.

It's OK to Cheat

DOS, as basic or as complex as you like it, is yours for the asking in ***DOS Cheat Sheet***, by Jennifer Fulton (Que, $19.99, 353 pages; 201 West 103rd Street, Indianapolis, IN 46290). Designed for beginning to intermediate PC users, *DOS Cheat Sheet* covers the ins and outs of DOS 6.22, with essential facts and tips highlighted. Each of the 42 fast-paced chapters begins with basic information everyone needs to know; then when you have the time, you can move into "Beyond Survival" for more-complex jobs, such as using DOS to customize your PC, checking your hard drive for problems, or performing tasks from within Windows and DOS Shell.

Each chapter also includes handwritten notes and shortcuts to help make DOS easier to understand and use. A reference card lets you keep vital information right next to your PC; a four-part appendix includes information on how to understand common DOS error messages, decipher DOS commands and wildcards, create a menu system, and select software.



Start gently with the fundamentals; you can get to the hard stuff later.

Power to Your PCs

If you run a small network, the new **MultiNet UPS Adapter** (Tripp Lite, $349; 500 North Orleans, Chicago, IL 60610, 312-755-5400) can expand a network-compatible uninterruptible power source (UPS) to monitor and control up to eight computers. This single-source UPS is designed to reduce network power-protection costs while providing increased security and control. MultiNet features multiple LED status indicators to let you know how everything's running up and down your network. In addition, because of its limited cabling requirements, MultiNet is easy to set up at installations where space is at a premium.

Tripp Lite's MultiNet UPS Adapter offers network power protection in a small package.

WHAT IF Microsoft Built Cars?

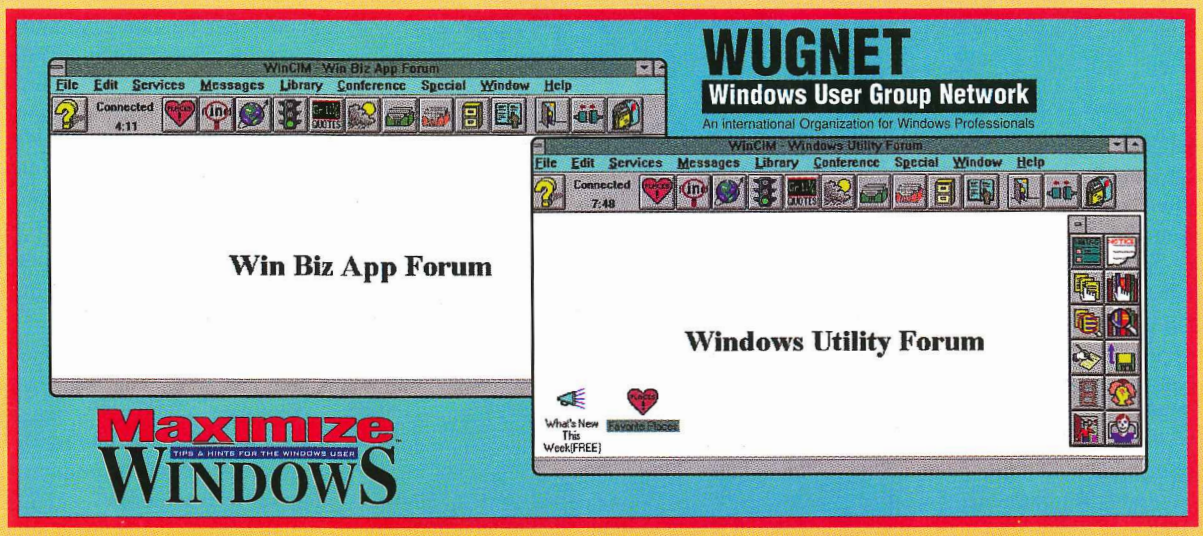
Posted on the Internet, from the "Disabled Student Services in Higher Education" mail list at the University of Buffalo:

THE TOP 10 WAYS LIFE WOULD BE DIFFERENT IF MICROSOFT BUILT CARS

10. New seats would require everyone to have the same-size rear.
9. We'd all have to switch to Microsoft Gas™.
8. The U.S. government would be getting subsidies from a car company instead of giving them.
7. Oil, alternator, gas, and engine warning lights would be replaced by a single "general protection car-fault" warning light.
6. Sun Motorsystems would make a car that was solar-powered, twice as reliable, and five times as fast, but would run on only 5 percent of the roads.
5. You'd be constantly pressured to upgrade your car.
4. You could have only one person in your car at a time, unless you bought car 95 or car NT—but then you'd have to buy more seats.
3. Occasionally, your car would just die for no reason, and you'd have to restart it. For some strange reason, you'd just accept this as normal.
2. Every time the lines on the road were repainted, you'd have to buy a new car.
1. People would get excited about the new features in Microsoft cars, forgetting completely that these features had been available for years in other brands.

Maximize WINDOWS ON COMPUSERVE!

Looking for the latest information on Windows utilities and business applications?



Join us on CompuServe, where *Maximize Windows* is the sponsor of two new forums: the Windows Utility Forum (GO WINUTIL) and the Windows Business Applications Forum (GO WINBIZ).

Both new forums are part of CompuServe's Microsoft Connection and are operated by the Windows Users Group Network (WUGNET), the world's largest on-line Windows user community. It's where you'll find on-line answers to your toughest Windows questions.

You'll also find 1000's of great files to download, including:

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- Word-processing and database add-ons
- Spreadsheets
- Accounting and financial programs
- Drawing, graphics, and desktop-publishing files
- Schedulers and contact managers
- CAD, science, and engineering applications
- Document-management tools
- Business accessories of all kinds

WINUTIL

- Program launchers
- File and disk managers
- System and memory utilities
- Configuration tools
- Windows95 utilities
- Diagnostic programs
- Shells and task managers
- Printing and font utilities
- Icon and mouse utilities
- DOS tools

Maximize Windows editors and authors, along with WUGNET experts, will be on the forums for discussion and to answer your questions. Join our on-line community and maximize your Windows expertise.

For a FREE CompuServe sign-up kit, call 800-848-8199. Ask for operator 426.

See you on CompuServe!

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... on the same PC!

System Commander

Try new OSes like Windows 95 & OS/2 and keep your Win 3.x.

Window 95 without the Risk! Installing a new OS often leaves existing operating systems unusable. But Windows 95 goes further and is unusually predatory.

System Commander helps protect your existing OSes from the predatory nature of new OSes. With *System Commander* you can keep your existing OS, like DOS & Win 3.11, and try exciting new OSes like Windows 95.

Easy Installation. *System Commander's* automatic installation will have your PC ready to add OSes in minutes. *System Commander* does not require a partition of its own and can even be installed from Windows 95 itself.

After installing *System Commander,* your first reboot brings up a menu of the OSes already installed. Select the OS you want and *System Commander* does the rest. Want to use another OS? Just reboot and make another selection.

Saves You Time and Effort. As you install new OSes, *System Commander* automatically copies key files and adds the new OS to its menu. It manages unique copies of *autoexec.bat*, *config.sys* and *command.com* for each copy of DOS, OS/2 or Windows 95 and updates any future changes.

The manual has more than 140 pages of important OS information. It features helpful hints on dozens of OSes including Windows 95, NT, OS/2 and most UNIXes including Linux. It's easy to evaluate new OSes without giving up the reliability of your existing operating system.

Complete Safety. Unlike drivers and TSRs, *System Commander* uses **no** resident memory. This eliminates any possible clash between *System Commander* and your OSes or software programs.

System Commander also identifies boot record and master boot record viruses and deletes them.

System Commander provides tamper proof, system security. Your private password protects any or all of your operating systems from unauthorized access.

We hope you'll never want to uninstall it. But should you ever want to, it comes with its own uninstaller to return your PC to its original state.

Solves Laptop Problems. Laptop users need different *.INI, config.sys or autoexec.bat* files for portable use and for connecting to the network. Whether it's for OS/2 or Win 95 simply select the configuration you need at boot time.

Saves You Money! Instead of investing thousands of dollars in additional PCs, *System Commander* makes it easy for you to have up to 100 different OSes on a single PC.

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